Croonian Lectures

ON THE

RÔLE OF FATS IN VITAL PHENOMENA.

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LECTURE II.*

THE attempts to make intelligible the rôle of fats in the life of the cell which I tried to review in Lecture I. fail to satisfy the needs, and we have to search for further knowledge of the physical behaviour of fatty substances insoluble in water before we can form ideas that approach the truth. How near we may hope to get with available data we can only determine after taking count of certain facts that have not yet been generally incorporated in the scheme of biological studies.

ORIENTATION OF MOLECULES IN SURFACE FILMS.

The most important and most promising group of facts bearing on the behaviour of fatty substances in the presence of water is that which points to the orientation of molecules in a surface. It may often be convenient for the sake of argument to consider molecules as if they were spherical, but the whole of chemistry is built upon theories of the disposition in space of the parts of a molecule in relation to one another, theories which receive confirmation from so many sides that they must in the main correspond to the truth, so that to suppose that molecules really are spherical amounts to ignoring most of what chemistry has taught. Molecules can neither be spherical, nor can all parts of them be indistinguishable from each other.

And though it may not be possible to say positively what the shape and pattern in space of many or even with certainty any molecules may be, it is quite certain that a molecule of palmitic acid is not spherical, and must be of an elongated form with at one end characteristics that are entirely different from those at the other end. It is equally certain that protein molecules are not spherical, but while no one can yet present a picture of the spatial pattern of a protein molecule, or follow into three dimensions the intricacies of its stereochemical structure—the very thought of it induces giddiness—the plan of the structure of a simple fatty acid like palmitic acid is necessarily simple, elongated, and with two distinguishable ends.

That the parts of which a molecule is composed determine the position also which it assumes in relation to other molecules of the same kind in crystals has been proved by the measurements of X ray spectra by Bragg; each atom in a crystal takes up a definite position in space in relation not only to the other atoms of the same molecule, but to those of the molecules in its neighbourhood. Harkins [1] and Langmuir [2] have pointed to a similar conclusion that in the surface presented by one liquid to another with which it is immiscible there may tend to be an ordered juxtaposition of the molecules so that some one and the same particular part of each molecule of the same kind is directed towards the mass of molecules of the other kind. This is merely a part of the ideas they have brought forward, but it is the part with which we are immediately concerned.

MEASUREMENTS OBTAINED BY OBSERVATION OF FILMS.

There are some beautiful measurements that afford the strongest proof of this conception in the work of N. K. Adam.[3] He has improved upon the methods employed by Langmuir, and learnt much from the still earlier work of Hardy. He measures the area occupied by a film composed of a fatty acid, an ester of a fatty acid, or some other derivative containing the long hydrocarbon chain, spread out on a water surface. The water is contained in a metal trough, the edges of which have been painted with paraffin wax, so that the water will not creep over them; and the surface of the water is cleaned so as to remove all contaminating foreign matter by sweeping across it a similarly paraffined bar of glass. On to the freshly cleaned surface a known weight, three or four small drops, of a dilute solution of the fatty acid in benzene is placed. The benzene evaporates, leaving a known number of molecules of the fatty acid on the surface, occupying an area that can be measured by pushing from one end of the trough a paraffined glass bar until it presses the film against a paraffined float stretching across the other end of the trough. The pressure exerted by the film on this float is detected by the movement of the float, and its amount measured by a balance, one arm of which is acted on by the float, while the other arm carries a pan for weights. Accurately adjusted jets of air prevent the film from being driven through the narrow gaps between the ends of the float and the sides of the trough. In this way the area occupied by the film can be measured, and the compressing force to which it is exposed also.

It is found that the area occupied by the film, when the molecules are packed close by the compressing force, corresponds to an area per molecule of 21 sq. Å (Å $= 10^{-8}$ cm.), this area being the same for all saturated fatty acids that give films, and also, it may be noted, for many other compounds in which a similar chain of carbon atoms is the common feature. From the density of the solid acid in bulk the volume occupied by a molecule of the acid in the solid material can be calculated. Supposing that the molecules in the film are actually as close packed as they are in the solid acid, and occupy, therefore, the same volume, if this volume be divided by the area in the film occupied by the molecule, the third dimension of the molecule is obtained, and in the case of palmitic acid the value for this dimension is nearly 24 Å. The area of 21 sq. Å would be given by a square with sides of 4·7 Å, so that a molecule of palmitic acid in the film would occupy in that case a volume with one dimension about five times as great as the others; the longer dimension is vertical to the water, one end of the molecule being on the surface of the water and the other directed away from it. At one end of the molecule is the acid carboxyl group, at the other the terminal methyl group of the paraffin chain. The end directed to the water must be that at which the carboxyl group is situated, for the reason, among others, that if for this group a methyl group be substituted, so that both ends are alike, neither end adheres to the water. The paraffin hexadecane, which differs from palmitic acid only at this point and in this way, does not form a film, there being no part of the molecule that is capable of binding it to the water; it is paraffin from end to end. The molecules remain heaped up and clinging together.

The same conclusion as to the orientation of molecules in surface films such as these had been arrived at before by Langmuir and by Harkins. The proof given by Adam's measurements for a larger number of substances is complete. It follows from this that substances which are insoluble in water may, nevertheless, not be indifferent to it. A molecule of a fatty acid such as palmitic acid, so far as its hydrocarbon chain is concerned, in regard, that is, to 15 out of the 16 carbon atoms of which it is composed, retains the characteristics of the paraffin hexadecane, which water will not wet. The terminal carbon atom in the carboxyl group has affinities for water which, though not able to overcome this paraffin property as it can in an acid with a shorter paraffin chain, in some measure even in one containing as many as 12 carbon atoms in all, is nevertheless able to exert a profound influence on the behaviour of the molecule in relation to water. Such molecules might be compared to the quills used for floats in fishing which have one end weighted. With quills of the same thickness, but different lengths, it would be found on attaching a certain weight to one

* Lecture I. appeared in THE LANCET last week. Lectures III. and IV. will appear in subsequent issues.

end, the same weight to all, that those of less than a certain length would be totally immersed in the water, those of more than that length would float vertically on its surface; whereas the same quills without the weights would all alike float lying horizontally on it. Paraffins are all immiscible with and lighter than water; the acids derived from them have with increasing length of hydrocarbon chain diminishing solubility, but still sum up to the one with 12 carbon atoms; those of higher molecular weight than this are not in any degree soluble; they float in a vertical position on the surface held upright by a force exerted on the carboxyl group by the water molecules.

The simile obviously cannot be pressed. For one thing, the fatty acid molecules are in consequence of strong attractions exerted by the paraffin chains on each other made to cohere to one another; and for another, they must be supposed to be in a state of kinetic activity, varying in amplitude according to whether the film resembles a solid, liquid, or gas. This molecular agitation, however, is not able to disturb the influences which determine what might be called their posture, the force acting between the water and one end of the molecule on the one hand, and that acting between the rest of the molecule and the corresponding parts of its neighbours, which, like it, are paraffin and incapable of affinity to water or anything aqueous.

The forces exerted by the paraffin chains on each other cause the molecules to cohere in continuity; the forces exerted by the water on the carboxyl group cause the molecules to spread on the surface, and limits their continuity to one in two dimensions, in the sense that the film formed is one molecule thick, with that part of each which the water can bind adherent to the water, and that part directed away from the water which the water will not wet. In a paraffin such as hexadecane there is no part of the molecule which the water can wet, and consequently the molecules cohere in three dimensions, not only in two; no film is formed, and the paraffin does not spread over the water.

CHEMICAL PROPERTIES IN RELATION TO PHYSICAL BEHAVIOUR.

There is here a point in the behaviour of fatty acids and their esters that has hitherto not been taken into account by cytologists. Chemical properties are significant not only because of the chemical reactions which they make possible, but also because they determine the positions taken up by molecules in relation to one another, their physical behaviour. Oil does not mix with water, nor does any chemical reaction take place between them on any detectable scale at the ordinary temperature. But there are conditions in which the molecules of oil in contact with water are proved to range up in a definite formation. This ordered juxtaposition of molecules at an interface cannot be overlooked in the attempt to arrive at some intelligible conception of the structural relationships of the components of cell substance.

Another point that Adam has brought out is this: the physical properties of film-forming substances are quite different in the films from those that the same substances exhibit in bulk. Palmitic acid in bulk is a solid up to the temperature of 62·6° C.; in a film on water, if the pH is 5 or less it is liquid at the ordinary temperature of the air. The solidity or fluidity of the film in these experiments is judged by the behaviour of motes floating in it. When the film is solid these are stationary; when it is fluid they move about continually in any direction. A sufficient compressing force can cause a film of palmitic acid to solidify at the room temperature; a force, for instance, of the order of 50 atmospheres may do so, though this does not always occur, and the conditions determining the change have not been exactly defined. Liquid films are similarly obtained with other substances at temperatures far below their melting-point. Moreover, at a certain temperature, in the case of palmitic acid between about 20° and 32°, the compression remaining the same, the film undergoes a change which results in its area being increased by as much as 60 or 70 per cent., and then with a further rise of temperature expanding gradually and uniformly at a much slower rate. Other acids in the same series of lower molecular weight, though still insoluble, give films that are expanded at the ordinary temperature, as does also oleic acid, which even in bulk is of course liquid at still lower temperatures. Such expanded films behave, therefore, in many respects as if they were in a gaseous state.

The physical properties, then, of film-forming substances are quite different in the films from those that the same substances exhibit in bulk. Palmitic acid, which in bulk melts near 63° C. in the film, is liquid at the room temperature, and passes, by a transition reminding one of the passage of a liquid into a gas, into a condition more like that of a gas than a liquid at a temperature 30° below its true melting point. To account for these extraordinary phenomena there would appear to be two conditions that obtain in the film, and not when the substance is in bulk. In the first place molecules are in a single layer, there are no other molecules of their own kind beyond the surface film, no other paraffin chains to enhance the cohesive forces that their own paraffin chains exert on each other. If there were, the resultant of their attractions would act as a force at right angles to the surface and directed upwards from it, which would steady them and impede the freedom of their movements. Without this they are as boats without ballast, much more sensitive to the buffeting to which they are exposed. And then, secondly, in the film they are engaged at one end by the water; so far as that end is concerned it is soluble in the water, it shares so freely in the agitation of the water molecules under kinetic activity that the whole molecule is thrown into a state of kinetic agitation which it would not experience otherwise till its temperature had risen much higher than that observed in its environment. Liquefaction and vaporisation are incident to degrees of kinetic activity. When a solid substance liquefies we say its temperature has risen; it has really shared in the rise of temperature of its environment; and that means merely that kinetic activity has been imparted to it. Some of the kinetic activity necessary to make a monomolecular film of palmitic acid liquefy is not derived from the temperature of its surroundings, but appears to be due to the fact that the carboxyl group is in a sense soluble in the water.

When a substance passes from the liquid state to the gaseous state the distance between the molecules is greatly increased, far more even than the remarkable increase in the distance between the molecules in a film when it passes from the condensed to the expanded state. In an expanded film matter can be observed and studied in a state different from any state in which matter has previously been studied. It may be just to speak and think of it as a gas in two dimensions instead of three. But there is the difficulty about the distance between the molecules, and in any case it is hard to conceive of a gas confined in this way with its molecules moored to the water surface like captive balloons. Perhaps something similar exists in a film of adsorbed gas, where the molecules are known to be much closer together than those of the gas free in three dimensions.

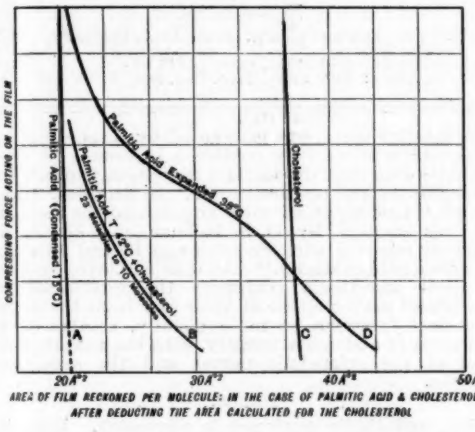
If the substances which are concerned in the formation of the lipoid membrane behave similarly in the surfaces where their molecules, characterised by the long paraffin chains of fatty acid radicals, are confronted by the aqueous solutions of the cell, it is clear that the physical conceptions that cytologists bring to the study of cells must be amplified.

BEHAVIOUR OF LIPOIDS IN SURFACE FILMS.

With Mr. Adam's help I have employed his methods for studying the behaviour of some of these substances in thin films on water. Two preparations of lecithine made by Levene's method from egg yolk, and a valuable preparation made and analysed at the Rockefeller Institute which Dr. Levene was so good as to give me, were found to form films on water which had, speaking generally, the same characteristics as those found by

Adam for the fatty acids and many other substances which he examined. The area occupied by a fatty acid chain, whether in a molecule of fatty acid or of its ethyl ester or triglyceride, is in a condensed film 21 sq. Å (Fig. 1, A). In an expanded film of palmitic acid, under a certain standard compression, this area is 42 or more according to the temperature (Fig. 1, D). At room temperature the area occupied by each of the two fatty acid chains in lecithine was 54 and 58 in the case of my two preparations, and 56·6 (Fig. 2, D) in that of Levene's lecithine proved by analysis to be pure, and at the lowest temperature at which it was measured, 4·5° C., 52·6. The curve of diminishing area with increasing compression traced up to a compressing force of about 60 atmospheres, even at this temperature, showed no signs of the film condensing. It is not possible, therefore, under the conditions of these experiments, to obtain a film of lecithine in a state in which the fatty acid chains are packed close together. The figures seem to indicate, as might be expected, that the glyceryl cholyl phosphoric acid, which links the two fatty acid chains in lecithine, occupies a considerably greater space than the two carboxyls of two fatty acid molecules, prevents the two paraffin chains from coming as close as they otherwise would, and so diminishes the cohesive force that these chains exert upon each other.

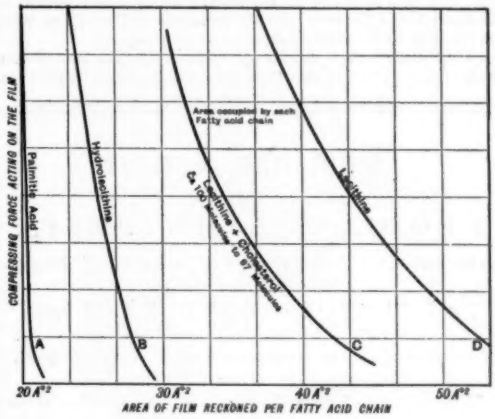
FIG 1.



A preparation of pure hydro-lecithine, which also I owe to Dr. Levene's generosity, was found to give not an expanded film but a condensed one; in this, at the standard compression, the area occupied by each fatty acid chain was 28 (Fig. 2, B), and even under the very high compression that films of this substance withstand of the order of 200 atmospheres, the area was barely as small as that for the same chain in a fatty acid molecule in a film on water at a fortieth of this compression. It is safe to say, then, that the large polar group in lecithine prevents close packing of the fatty chains, and so diminishes the tenacity with which these chains will cohere to each other, at the same time widening the intervals between them through which foreign molecules may pass. For, incidentally it may be said, molecules do pass between the paraffin chains even of a condensed fatty acid film. Through such a film water was shown to evaporate with a considerable velocity. An expanded film must give greater facilities for this to occur, and a lecithine film still more.

The behaviour of cholesterol and its esters was also studied in this way. Seeing that the chemical constitution of cholesterol is still not yet determined in all particulars, the measurements cannot furnish as clear a picture of the structure of the film. Cholesterol prepared with every precaution from gall-stones, recrystallised several times, faultless in appearance, and with the correct melting-point, was heated to remove water of crystallisation, several solutions were made, and many films of each measured. The mean area occupied by the molecule at the standard compression force was 38·3 sq. Å (Fig. 1, C). The compressibility is small, as under 20 times this compression force the area was reduced only about 3 per cent. This suggests that the molecules must be almost as closely packed in the film as in the substance in bulk; but since the successive layers in that condition might interlock with each other, it is not possible to assume that the specific gravity of the substance in a monomolecular film is the same as that which it has in bulk. If, however, it is, the third dimension of the molecule, the thickness of the film, was 16 Å, and the compression force required to reduce its area by 3 per cent. was about 170 atmospheres; the vertical length of the molecule would be a little less than three times its breadth. Its molecular area seems to be the same on dilute acids as it is on water.

FIG. 2.



Cholesterol is no more soluble in water than the higher fatty acids, and it is not without interest that it should form films like these, though with the imperfect knowledge that we have of its chemical constitution it is impossible to say what the grouping is that binds it to the water surface until some of the derivatives that can be made from it have been studied. Certain peculiarities observed in its own behaviour also need further investigation, and may prove of interest.

Cholesteryl palmitate, made from it with palmityl chloride, appears not to give a real film. The area covered by one solution at standard compression varied considerably from 18·6 to 22·7 per molecule, and averaged 20·3; with another solution it averaged 19·0, but the film was visibly solid and not uniform; the molecular area indicated by the measurements appear impossibly small. The only thing to be learnt from this is that the esterification of cholesterol with palmitic acid prevents both these substances from behaving in their characteristic way, and this fact points to the alcoholic hydroxyl in cholesterol as being the group which fixes it to the water. Other esters of cholesterol have not yet been studied.

INFLUENCE OF CHOLESTEROL ON BEHAVIOUR OF LECITHINE IN FILMS.

But in view of many facts with regard to the physiological influence of cholesterol in modifying the behaviour of lecithine, it was interesting to study the effect that cholesterol had on films of lecithine when the solution used for making the film contained both substances. And also it was interesting to see whether cholesterol had any effect on simple fatty acids under such conditions. The method used was to prepare solutions containing the fatty acids and cholesterol,

both of course in known suitable amounts, and after measuring the area of the films under different compression forces to reckon what part of this area would be accounted for by the amount of cholesterol put on, deduct this amount from the area of the film, and compare the area left for each molecule of fatty acid to occupy with that which it would have occupied had the cholesterol not been present. In a word, in every case there was recognisable a tendency for this area to be diminished. Even with palmitic acid at ordinary temperature on dilute acid, when, as Adam has shown, the carboxyl groups appear to be in contact, but not the paraffin chains, until the compressing force reaches more than a certain value, the fatty acid molecules in the presence of cholesterol are closer together than they otherwise would be at these lower pressures. With acids that give expanded films, tridecylic acid at the room temperature and palmitic at temperatures between 31 and 40, for instance (Fig. 1, B and D), the effect is much more striking, the area being reduced, though the effect is not so pronounced as it is with expanded fatty acid films.

This effect, the extent of which the curves shown will make clear, is difficult, of course, to interpret, so long as the chemical constitution of cholesterol remains obscure; but the fact that it is observed with fatty acids even more than with lecithine, though still observable with this (Fig. 2, C and D), tempts one to suppose that the action is between the cholesterol and the paraffin chains rather than the complex glyceryl cholyl phosphoric acid, and therefore is again a change in physical behaviour, an alteration in the force of cohesion between these chains, that depends upon chemical characteristics not capable of resulting in actual chemical union in the ordinary sense.

These are the points that this method of investigating these substances has so far brought out. There is obviously much need for further investigation in order to get the definition clear, and it is to me at least obvious that the work which Adam is doing is on the very foundations of physiology, though not of physiology alone.

REFERENCES.

1. W. D. Harkins and others: Jour. Amer. Chem. Soc., 1917, xxxix., 354.
2. I. Langmuir: Ibid., 1917, xxxix., 1848.
3. N. K. Adam: Thin Films, Proc. Roy. Soc., A, 1922, ci.

Hunterian Lecture

ON

REGIONAL ANÆSTHESIA.

Delivered at the Royal College of Surgeons of England on Feb. 13th, 1925,

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WITH regional anæsthesia is added to the armamentarium of the surgeon a new weapon by means of which the safety and comfort of the patient are appreciably increased. As the method is based solely upon accurate anatomical knowledge and sound interpretation of physiological phenomena it is perhaps not unworthy to associate this lecture with Hunter's name.

Definition.—By regional anæsthesia is meant abolition of sensation of pain in a definite part of the body by the action of a non-volatile anæsthetic solution introduced in the neighbourhood of the nerves supplying that part.

HISTORY.

The method was originated by Hugo Sellheim[1] in his experimental work on abdominal surgery. It was first published in 1905. Six years later, in 1911, Lawen[2] injected the posterior roots from the ninth dorsal to the third lumbar for a nephrectomy in an old and debilitated patient suffering from emphysema, chronic bronchitis, and arterio-sclerosis. He was the first to introduce the term conduction paravertebral anæsthesia. In 1912 Finsterer, who took up this method, published his results,[3] and a little later Kappis[4 5]; the latter, after employing the method during a period of ten years, reported in 1922 80 operations on the kidney by this method. By 1916 Ziegel,[6] who extended regional anæsthesia to abdominal as well as renal operations, published a report of 600 cases. By 1919 he had performed 2000 operations under paravertebral conduction anæsthesia.[7] Others followed, in Germany, Braun and Hartel,[8] who called attention to some important points. In France Pauchet,[9] with the assistance of Labat, Sourdat, Laboure, and Laborde, extended the method to all regions of the body. In 1917 Wendling[10] in Thèse de Basle described a method of infiltrating the solar plexus with an anæsthetic solution. This extended the use of regional anæsthesia from the peripheral to the sympathetic nervous system. The method of anæsthetising the solar plexus described by Wendling, the anterior route, was elaborated by Kappis and by Naegeli,[11] who in 1919 published 18 cases. In 1920 Labat[12] described the method of inducing splanchnic analgesia by the posterior route. In America, Allen, Labat,[13] Lawsley and Pugh[14] popularised the method. In this country Mr. O. S. Hillman and Dr. R. E. Apperly reported three months ago 48 and 43 cases of splanchnic analgesia.[15] As it is employed to-day, regional anæsthesia comprises the infiltration of peripheral nerves either at their exit from the intervertebral foramina or more distally, combined, in the cases of abdominal surgery, with the anæsthetisation of the splanchnic nerves and the semilunar ganglia.

DRUGS.

The anæsthetic employed is novocaine. It is six to ten times less toxic than cocaine. In the strength of ½ per cent. solution large quantities can be given with safety if certain precautions are taken. As its melting-point is 156° C. it can be sterilised in an autoclave. It is soluble in water and saline solutions. To avoid all possibility of overdose, 1·5 g. of novocaine powder, sterilised in a sealed glass ampoule, are dissolved in 300 c.cm. of sterile normal saline. The toxicity is so low that the whole amount can be safely given to one patient. It produces no local irritation or infiltration and so is absorbed painlessly. The Board of Trustees of the American Medical Association, in their report[16] on an extensive survey to study the occurrence of accidents arising out of the use of local anæsthetics, quote only one death due to novocaine. The use of adrenalin is not advisable, neither is it necessary. The injections should be in the vicinity of a nerve, not endoneural. If a nerve is bathed in a solution of novocaine the inevitable result is anæsthesia. The anæsthesia lasts two hours or more. Anæsthesia to pain is complete, touch is not entirely abolished, pressure sense is not lost, and this must be explained to the patient, as otherwise the sensation of pressure may be interpreted as pain. Motor power is not affected, but voluntary movements are irregular and weak owing to sensory disturbance and loss of muscular tone; this latter is a great advantage as it produces excellent relaxation, unsurpassed by that obtained by the deepest narcosis anæsthesia. The preliminary use of narcotics is useful in most patients. Morphine and scopolamine in the usual doses are given half an hour before the induction of anæsthesia, and can be repeated before the operation is commenced.

INSTRUMENTS.

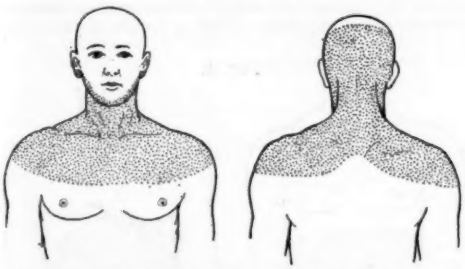
The syringe employed is of the record pattern, has a glass barrel of 22 c.cm. capacity, graduated up to 20 c.cm., so leaving a space for preliminary aspiration. Aspiration is absolutely essential, as intravenous

injection of novocaine will produce cessation of respiration; this is instantaneous and may last several hours and may kill the patient. Needles of various length are used, the smallest for the formation of dermal wheals, so rendering further punctures painless. Paravertebral anæsthesia can be divided in three groups: cervical, dorsal, and lumbar.

CERVICAL PARAVERTEBRAL ANÆSTHESIA.

The sensory nerve-supply to the neck is derived from the second, third, and fourth cervical nerves, mostly from the anterior primary divisions. Each nerve, after emerging from the intervertebral foramen, is joined by a grey ramus communicans from the superior cervical sympathetic ganglion, and divides at the tip of the transverse process so as to form three loops of the cervical plexus lying under cover of the sterno-mastoid muscle. From these loops branches of distribution arise. The cutaneous branches form the sensory supply to the head, neck, and shoulders. The nerves concerned are six in number. They appear at the posterior border of the sterno-mastoid muscle: two are distributed upwards, the great auricular and the small occipital; one runs forwards, the transverse cervical; and three pursue a downward course, the three descending cervical nerves. Of the posterior primary division the second cervical gives off the great occipital nerve, which forms the chief cutaneous supply of the back part of the scalp. Hence by blocking the second, third, and fourth cervical nerves close to the intervertebral foramina an extensive area of anæsthesia is obtained, extending in front from the margin of the lower jaw to the level of the nipples and behind from the occipital area to the shoulders. (Fig. 1.)

FIG. 1.



Area of anæsthesia after bilateral cervical paravertebral block (C_2, C_3, C_4).

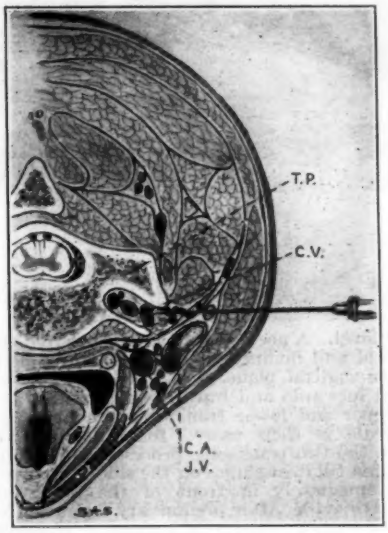
Cutaneous anæsthesia is complete, and manipulation of the blood-vessels, lymphatic glands, muscles, fasciæ, and the thyroid gland is painless.

Technique.—The nearest and safest approach to the second, third, and fourth cervical nerves is from the lateral aspect of the neck. The transverse processes of the cervical vertebræ are identified by palpation and the following points used as landmarks: The upper border of the thyroid cartilage is at the level of the transverse process of the fifth cervical vertebra; one finger's breadth below the tip of the mastoid process marks the level of the transverse process of the third cervical vertebra; this corresponds to the angle of the jaw. The head is turned to the opposite side and these two points marked by raising two cutaneous wheals. The vascular bundle is displaced inwards and a needle 6 cm. long inserted transversely through each wheal till the desired transverse process is reached (Fig. 2). After preliminary aspiration 5 c.cm. of 1 per cent. novocaine is injected for each nerve. The third and fourth nerves are injected through the lower wheal, the second through the upper one. In a short neck one wheal can serve for all three nerves. Twenty c.cm. of ½ per cent. solution is next distributed along the posterior margin of the sterno-mastoid muscle. Anæsthesia is established at once and lasts for two hours. Bilateral cervical block can be induced with ½ g. of novocaine. Paresis of the diaphragm, even if it occurs, is harmless. The most extensive operations in the neck have been performed under cervical paravertebral anæsthesia.

DORSAL PARAVERTEBRAL ANÆSTHESIA.

The induction of the dorsal paravertebral anæsthesia is the most delicate of all regional methods. It requires constant practice, and to be successful the relation

FIG. 2.



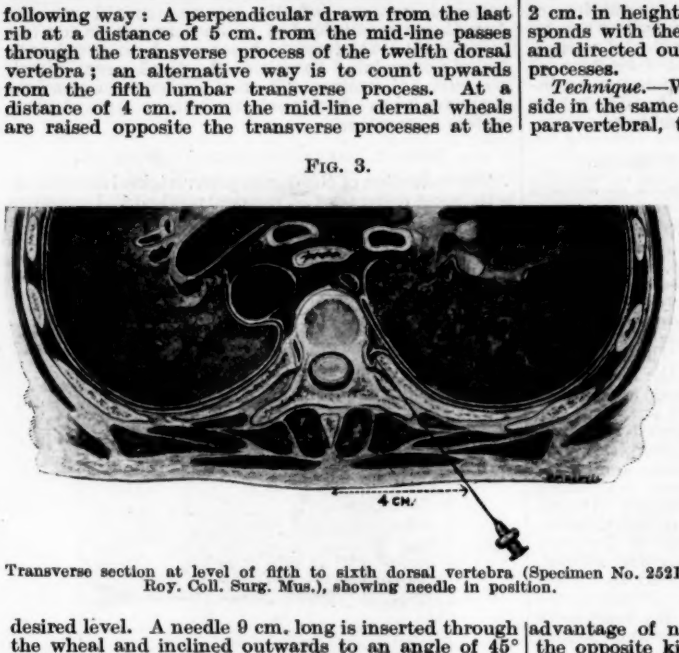
Transverse section of neck: level of fourth cervical vertebra, showing needle in position. T.P., transverse process; C.V., cervical nerve; C.A., carotid artery; J.V., jugular vein.

of the nerves to the surrounding bony structures must be visualised. Each nerve is formed in the neighbourhood of the intervertebral foramen by the junction of the anterior and posterior roots and at once divides into an anterior and posterior primary divisions; from the anterior primary division of all the dorsal nerves with the exception of the first two, a series of fine nerves arise connecting these somatic nerves with the sympathetic system. These visceral, splanchnic, or white rami communicantes innervate through the sympathetic trunk the viscera and vessels of the splanchnic area. In making paravertebral injections the object is to bathe the nerves at their point of division and produce anæsthesia in the zone supplied by both the primary divisions and the sympathetic twig. After emerging from the intervertebral foramen each nerve lies between adjacent transverse processes and runs in the intercostal space towards the angle of the rib above; it is accompanied by an artery and vein. In this space extending from the tubercle of the rib to the costal angle the nerve lies between the external intercostal muscle and the internal intercostal membrane, which alone separates the nerve from the pleura and lung. Continuing its course in the intercostal space each nerve travels around the thorax, giving off a lateral cutaneous branch in the midaxillary line and an anterior cutaneous branch in front. The upper nerves supply the chest wall; the lower the integument of the abdomen and part of the back.

Technique.—With the patient lying on the opposite side, the back arched, and a pillow under the loin, the twelfth spinous process is identified in the

following way: A perpendicular drawn from the last rib at a distance of 5 cm. from the mid-line passes through the transverse process of the twelfth dorsal vertebra; an alternative way is to count upwards from the fifth lumbar transverse process. At a distance of 4 cm. from the mid-line dermal wheals are raised opposite the transverse processes at the desired level. A needle 9 cm. long is inserted through the wheal and inclined outwards to an angle of 45° with the sagittal plane of the body. The needle is directed forwards and inwards and contact is made with upper and lower transverse processes in turn, the needle is then passed forwards and inwards between the two transverse processes and anterior to the lamina till it impinges on the side of the vertebral body immediately in front of the inter-vertebral foramen (Fig. 3). After preliminary aspiration 5 c.cm. of 1 per cent. novocaine is injected. If during the progress of the needle paræsthesia is established the injection is made at once. As many nerves as necessary are injected and the field tested with a sharp needle; if a band of normal sensation is found the particular area is injected again. Puncture of the pleura is painless, but injection in the pleural cavity gives rise to coughing, and, of course, no anæsthesia is established. Puncture and injection of the lung give rise to pain and coughing. The upper dorsal paravertebral block is indicated for operations on the chest, and in conjunction with the brachial plexus block for operations on the upper limb, the axilla, and for radical amputation of the breast. The lower paravertebral (seventh to twelfth) can be used for upper abdominal operations (Fig. 4), but, as will be explained later, it is not the method of choice.

FIG. 3.



Transverse section at level of fifth to sixth dorsal vertebra (Specimen No. 252B, Roy. Coll. Surg. Mus.), showing needle in position.

LUMBAR PARAVERTEBRAL.

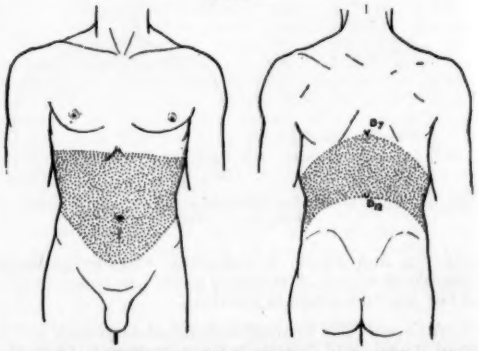
The lumbar plexus is situated in the substance of the psoas muscle; the four upper lumbar nerves which contribute to its formation, after emerging from the intervertebral foramina course slightly downwards and lie in close relationship with transverse processes; the first lumbar nerve in front of the second lumbar transverse process, and so on. The branches of the plexus are: The ileo-hypogastric and ileo-inguinal from the first, the genito-crural from the first and second, the external cutaneous from the second and third, the anterior crural and obturator from the second, third, and fourth; the remainder of the fourth with the fifth form the lumbo-sacral cord. The cutaneous area supplied by these nerves occupies the lower part of the abdomen and part of the back and the anterior and inner parts of the thigh. The guide to the nerves are the transverse and spinous processes of the lumbar vertebræ. It will be observed that the spinous processes are vertical laminæ about 2 cm. in height and that their upper border corresponds with the transverse processes which are short and directed outwards at right angles to the spinous processes.

Technique.—With the patient lying on the opposite side in the same position as for the induction of dorsal paravertebral, the spinous processes of the lumbar vertebræ are identified by counting from the first or from the fifth. Each spinous process is palpated till its upper border is felt, a wheal is raised at that level 3 cm. from the mid-line. A needle 10 cm. long is introduced through the wheal and directed antero-posteriorly till the transverse process is reached; the needle is then made to pass over the upper border of the transverse process. It is the rule to induce paræsthesia as the nerves are of large size; 8 c.cm. of novocaine is injected around each nerve. To anæsthetise the fifth lumbar nerve, the needle is inserted below the fifth transverse process. Lumbar paravertebral is used in combination with the lower dorsal for operations on the kidney and ureter; anæsthesia is complete and the most difficult renal operations have been done without a general anæsthetic (Fig. 5). It has the advantage of not throwing an additional burden on the opposite kidney.

SPLANCHNIC ANALGESIA.

The most interesting and perhaps the most important part of regional anæsthesia is splanchnic analgesia. It is not only a valuable addition to practical surgery but has opened up a field of research. It allows the surgeon to interfere to a more extensive degree in the upper abdomen and robs major abdominal operations of a great deal of their seriousness. The innervation of the abdominal viscera is derived partly from the vagus and partly from the sympathetic. Section of the spinal cord between the fifth and sixth dorsal vertebræ in a dog produces analgesia of the abdominal viscera (Kappis[4 5 13]). Section of the splanchnic nerves produces analgesia of the stomach, liver, gall-bladder, spleen, and small intestine. Section of the spinal nerves supplying the abdominal wall produces parietal anæsthesia only; visceral sensibility remains unaltered (Hoffman[13]). Application of novocaine gives similar results. The viscera, as is well known, are insensitive to cutting or cauterising, but the retroperitoneal tissue is very sensitive

FIG. 4.

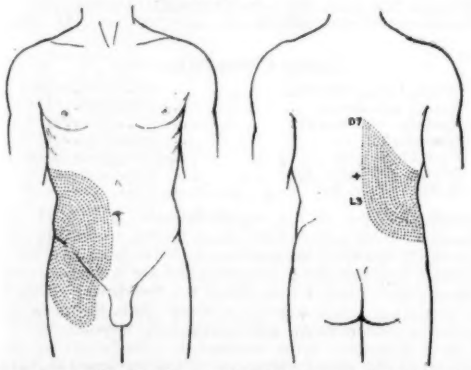


Area of anæsthesia after bilateral paravertebral block from seventh dorsal to twelfth dorsal nerves.

especially to pulling. Every surgeon is aware that the lesser sac of peritoneum and the region of the cœliac artery are exceedingly responsive to manipulations. The sympathetic fibres therefore collect and transmit to the cerebro-spinal system through the splanchnic nerves afferent impulses from the viscera. The solar plexus is a mass of considerable size composed of nerve-fibres intermingled with ganglionic cells; it is situated behind the peritoneum at the level of the first lumbar vertebra, in front of the crura of the diaphragm, near the origin of the cœliac axis. It is composed of three parts—the cœliac plexus proper and the two semilunar ganglia—situated close to the suprarenal bodies, the right being overlapped by the inferior vena cava. The plexus is continuous with subordinate plexuses—renal, phrenic, mesenteric, &c. Each semilunar ganglion is joined by the splanchnic nerves. The great splanchnic nerve is derived from the ganglionated thoracic sympathetic chain, and originally from the fifth to ninth dorsal nerves; the small splanchnic comes from the ninth and tenth dorsal nerves. They pierce the crura of the diaphragm and join the semilunar ganglia. Splanchnic analgesia is obtained by bathing with novocaine the retroperitoneal space containing the semilunar ganglia.

Technique.—The patient lies on the side opposite to that of the injection, a pillow under the loin. The site of the injection is found by identifying the twelfth rib and taking on it a point 7 cm. distant from the mid-plane of the body (Fig. 6). In cases where it is difficult to identify the last rib, the injection level is found by determining the spinous process of the first lumbar vertebra. A dermal wheal having been raised on the selected point, a needle 12 cm. long is introduced forwards and inwards at an angle of 35° for a distance of 8 or 9 cm. When the body of the first lumbar vertebra is felt, the needle is withdrawn and reintroduced at a smaller angle till it is felt to glide tangentially along the side of the vertebral body (Fig. 7). If the angle is less than 30° there is danger of transfixing the renal

FIG. 5.



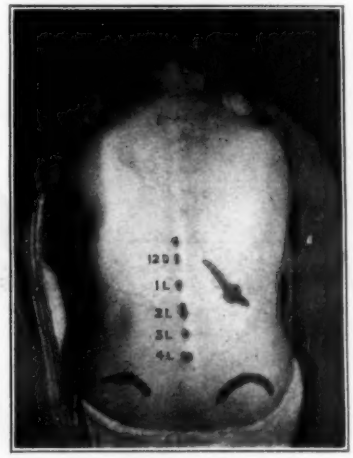
Area of anæsthesia after unilateral paravertebral injections from seventh dorsal to third lumbar nerves; suitable for operations on kidney and ureter.

pedicle or the kidney; at an angle of more than 45° the intervertebral foramen may be entered. If no blood is withdrawn on aspiration 60–80 c.cm. of ½ per cent. novocaine is slowly injected. The solution diffuses in the retroperitoneal tissue from the diaphragm downwards along the bodies of the vertebræ. If the solution is coloured with indigo-carmine or methylene-blue, on opening the abdomen, it will be seen infiltrating a wide retroperitoneal area. The procedure is repeated on the opposite side; one dermal wheal and one puncture on each side is sufficient; ¾ g. of novocaine induces good splanchnic analgesia

FIELD BLOCK.

The anæsthetisation of the abdominal wall is obtained by injecting the sheath of the rectus muscle at a suitable level. Wheals are raised on each side of the outer border of the rectus at the level of the

FIG. 6.



Shows twelfth rib and cutaneous wheal 7 cm. from midplane: point of entry for splanchnic injection.

ninth costal cartilage and just below the umbilicus. A needle is introduced through each wheal till it is felt to puncture the anterior layer of the rectus sheath; this imparts a characteristic resistance to the needle and serves as a landmark; puncture of the sheath is painful. Half per cent. novocaine is injected into the muscle and deep to it in a fan-shaped manner radiating from the point of puncture; when the injection is carried out carefully the rectus muscle becomes relaxed and the parietal peritoneum insensitive to gentle manipulation. The subcutaneous tissue is next injected along the semilunar line through the same dermal wheals. It must be remembered when this procedure is adopted there remains a lateral zone of unaltered sensation. It is therefore important for the success of the field block that all incisions be made within the anæthetised area with a sharp scalpel and not scissors; retractors must be introduced gently and the edges of the wound separated gradually. If manual exploration is necessary the incision must be of adequate size, to admit the hand easily. The patient is aware that his viscera are being manipulated, but he does not complain of pain. In nervous patients, or for the mental comfort of the surgeon, a first-stage ether anæsthesia for a few minutes is a useful adjunct. The abdominal field block can be varied so as to suit various incisions.

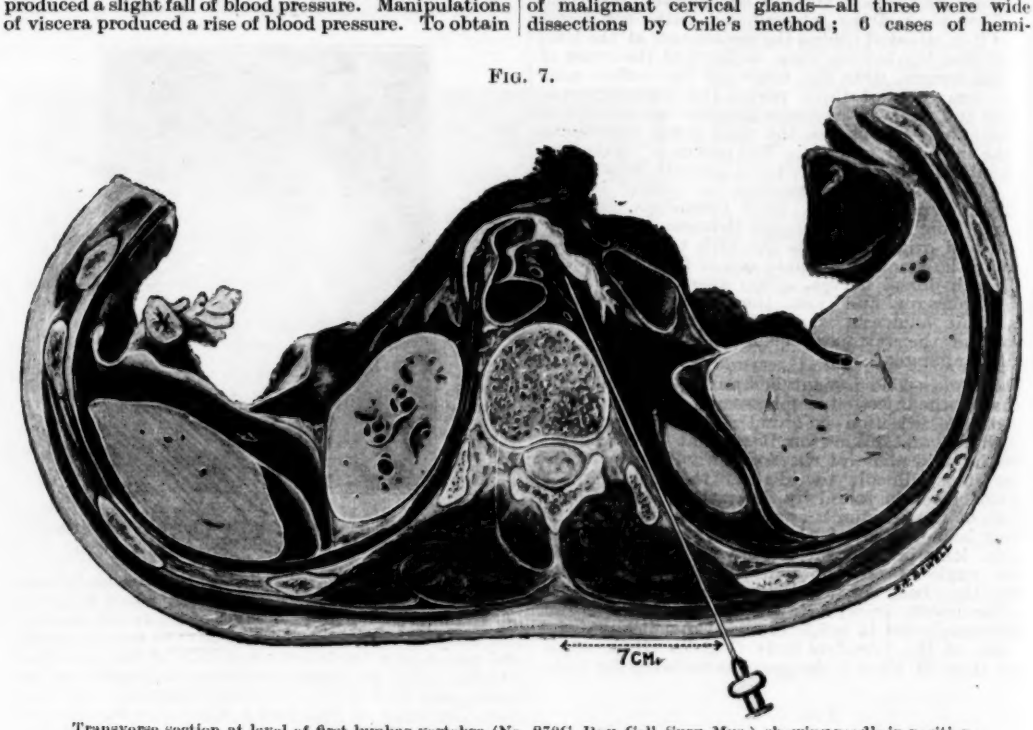
EXPERIMENTAL EVIDENCE OF REGIONAL ANÆSTHESIA.

To obtain some evidence of the effects of regional anæsthesia experiments were carried out on cats, rabbits, and dogs. The variations of blood pressure were taken as an index, not because it was considered that these were an accurate record of the various degrees of shock, but because it was the most convenient method of obtaining a graphic record. In all cases but two the animals were anæsthetised with ether, and the depth of anæsthesia in most cases was such that the conjunctival reflex was not lost. The blood pressure was recorded by connecting the central end of the carotid artery to a mercury manometer carrying a writing point. The experiments performed included abdominal section, manipulation of various viscera, twisting and dragging of the stomach and intestines,

gastrectomy, splenectomy, faradic stimulation of the peritoneum, viscera, splanchnic, and sciatic nerves. All the experiments were first performed under the influence of ether alone and then repeated after a local, regional, or splanchnic infiltration with ½ per cent. novocaine. Each addition of ether on the mask produced a slight fall of blood pressure. Manipulations of viscera produced a rise of blood pressure. To obtain a fall more violent manipulations had to be done. In rabbits a fall was more easily obtained. The viscera were kept moist and warm throughout the experiment, and inside the abdominal cavity most of the time. Exposure to air of a viscus rapidly produced loss of response to stimulation. The results were similar to those obtained by Prof. Pannett [17] in his experiments on anoci-association in 1914. Splanchnic anæsthesia was more effective than local applications. The experiments showed that, whilst under general anæsthesia, manipulations of the viscera produce alterations in the blood pressure, similar manipulations under regional anæsthesia had hardly any or no effect. Regional anæsthesia therefore blocks the paths of afferent impulses from the viscera and protects the medullary centres, in particular the vasomotor centre (Fig. 8).

Further, histamine is a normal constituent of the intestinal contents and the toxæmia of intestinal obstruction is at least partly due to its absorption, and it has been shown that the etherisation of an animal makes it more sensitive to the effect of histamine. In practice it was found that splanchnic anæsthesia offered the patient a better chance of recovery from intestinal obstruction, besides the more obvious advantages of avoiding inhalation accidents. Finally it was observed that intravenous injection of novocaine invariably produces cessation of respiration and a marked fall of blood pressure, leading to the death of the animal (Fig. 9).

FIG. 7.



Transverse section at level of first lumbar vertebra (No. 270C, Roy. Coll. Surg. Mus.), showing needle in position, perforating diaphragm posterior to right semilunar ganglion.

RECORD OF CASES AND RESULTS OBTAINED.

My series consist of 84 cases operated upon under regional anæsthesia. Of these, 35 cases were operated upon by my corresponding senior colleague—Mr. Arthur Evans; 32 by myself and the remaining 17 cases by the other surgeons at Westminster Hospital. Table I. shows the number of each type of regional anæsthesia employed. The 12 cases of cervical paravertebral comprise: 4 cases of excision of malignant cervical glands—all three were wide dissections by Crile's method; 6 cases of hemi-

TABLE I.—84 Cases.

Cervical paravertebral	12
Dorsal and lumbar	11
Epidural and sacral	2
Splanchnic	41
Field block only	14
Sciatic, obturator, &c.	2
Median, ulnar, &c.	2

thyroidectomy: 2 for exophthalmic goitre, 1 for adenoma, 3 for parenchymatous goitre, including one case with marked dyspnœa, due to pressure on a deviated trachea and complicated by a large retrosternal lobe; and 1 operation for fractured clavicle. The remaining case was that of an epithelioma of the aryepiglottidean fold, with secondary deposits in the cervical glands. The operation consisted in the removal of the glands, ligature of the external carotid, lateral transthyroid pharyngotomy, excision of the primary growth, reconstruction of the pharynx, laryngotomy, and suture. The operation lasted two and a half hours. The patient was 61 years old; he left the table with a pulse of 90. There was no shock. He died in the third week from a mediastinal abscess. Two out of the 12 cases (one exophthalmic goitre and the last case mentioned) had light general anæsthesia towards the end of the operation.

Of the 11 dorsal and lumbar paravertebral, 9 were renal operations: 3 nephrectomies, 3 pyelolithotomies, 2 nephrolithotomies, and 1 nephropexy and appendicectomy. One patient on whom a pyelolithotomy was performed by Mr. Evans had marked curvature of the spine, and the space between the costal margin and the iliac crest was very narrow; unusual pulling on the

kidney was necessary before the pelvis could be exposed. No general anæsthetic was necessary, the patient being comfortable throughout the operation. One nephrectomy was done for a pyelonephritis diagnosed five years previously at a genito-urinary hospital; operation was advised, but the patient, a lady of 49 years, preferred Christian Science treatment. When I saw her five years later she had a large tumour in the loin, rigors, purulent urine, and a very low percentage of urea. The kidney was universally adherent and difficult to deliver. The patient had very light general anæsthesia towards the end of the operation. Recovery was uneventful.

The remaining two cases of dorsal paravertebral are of interest.

One was an enormously fat woman, 63 years of age, on whom I operated seven days previously for left posterior subphrenic abscess. She was extremely ill and cyanosed; in the upper part of the abdomen an indefinite tender swelling could be felt deep down behind the extremely adipose abdominal wall; the abscess was still draining. The temperature was 103° F., pulse 130, respiration 35. General anæsthesia was quite out of the question; under regional anæsthesia a transverse incision was made below the costal margin on the left side, through the rectus muscle. A large collection of pus, débris, and gastric contents were evacuated from the lesser sac of peritoneum. The patient recovered. (She died four months later from heart failure.) In one case the third to fifth lumbar and the first and second sacral were injected for persistent pain following a Fourneaux-Jordan amputation done three weeks previously. The relief of pain was rapid, complete, and permanent.

The epidural and sacral block was done in two cases, both for perineal excision of the rectum, performed by Mr. Evans. The 14 cases of field block are shown in Table II. Of these, 11 were successful and three were

TABLE II.—*Field Block, 14.*

Orchidectomy	3
Double herniotomy	4
Excision of knee-joint	1
Wiring patella	1
Gastrostomy	1
Miscellaneous	4

failures, owing probably to errors of technique. Table III. shows the cases operated upon under

TABLE III.—*Splanchnic, 41.*

Cholecystectomy	10
Cholecystostomy	4
Gastrectomy	6
Gastrojejunostomy	5
Right hemicolectomy	2
Appendicectomy	4
For acute intestinal obstruction	6
Laparotomy	4

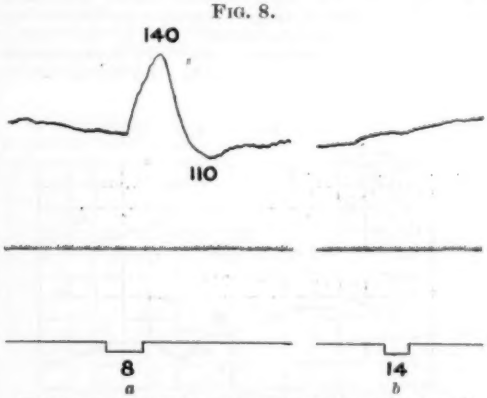
splanchnic analgesia. A far larger number of cases was actually done, but I have discarded from this table all those cases that needed a general anæsthetic, after the abdomen was opened.

After inducing splanchnic anæsthesia there is generally a slight fall of blood pressure for 10 or 15 minutes, then the blood pressure rises above normal, the pulse becomes slower. Some patients complain of nausea when the stomach is manipulated; in the cases in this table the analgesia was successful, and the following important points were noticed: (1) Relaxation of the recti was perfect; (2) manipulations of the viscera, even when doing a gastrectomy, had little effect on the blood pressure; (3) there was complete abdominal silence; (4) suturing the abdomen presented no difficulty. In other cases, however, parietal anæsthesia alone was obtained. In these ether was administered. It is very important that only the light first stage should be aimed at, as if the second stage is reached the patient begins to struggle and a good deal of the benefit of the regional method is lost.

In cases of acute intestinal obstruction splanchnic analgesia has no rival. I will quote one case:

I was asked to see a woman aged 70; she had intestinal obstruction of four days' duration. I was shown several bowls of fæcaloid material vomited by the patient during the day. The abdomen was distended, constipation was absolute, the pulse weak and at the rate of 110, temperature was normal. The operation was done under splanchnic analgesia, a loop of small intestine strangulated by bands was resected and end-to-end anastomosis performed; a tube

FIG. 8.

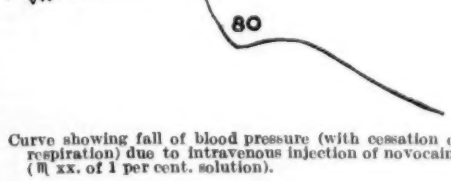


Blood-pressure tracing of a cat before (*a*) and after (*b*) splanchnic anæsthesia: effect of violent manipulation of stomach on blood pressure shown at 8 and 14.

was inserted in the small intestine above. I am convinced the patient would not have survived the operation had a general anæsthetic been given.

Cholecystectomy was done in ten cases, hemicolectomy for carcinoma of the cæcum and ascending colon—twice; of the six gastrectomies, four were for chronic ulcers situated high up on the lesser curvature, one for a pyloric ulcer and one for carcinoma of the stomach. Of all these cases, only one

FIG. 9.



Curve showing fall of blood pressure (with cessation of respiration) due to intravenous injection of novocaine (♏ xx. of 1 per cent. solution).

died: from peritonitis following a leakage after a gastrectomy. Cutting and suturing the various mesenteries were painless.

ADVANTAGES OF REGIONAL ANÆSTHESIA.

Operations can be performed with greater safety on patients with cardiac, renal, or pulmonary disease or diabetes. In acute obstruction, inhalation pneumonia is avoided and the toxæmia is reduced. Post-operative vomiting is only occasionally observed. There is marked diminution of shock. It is sufficient to witness a patient at the end of a severe operation to realise the value of the method. The charts show (Fig. 10) the condition of the blood pressure and the pulse-rate throughout a prolonged operation. What concerns pulmonary complications, it is claimed that those complications due directly to the inhalation of ether or chloroform are abolished. It is not claimed that the incidence of pulmonary embolism will in any way be affected by regional anæsthesia; but the effects of the vapour on the lungs is abolished. I quote from Prof. McDowall[19]: "It does not seem to be appreciated

that the lung tissue may, apart from mere irritation, suffer serious damage as a result of actual contact with the vapour of ether or chloroform." Further, under deep ether or chloroform anæsthesia, "the bronchioles do not contract (Brodie and Dixon quoted by McDowall) and the alveoli are exposed to particles which otherwise do not reach them." This accounts for such post-operative pulmonary complications which are preventable by substituting regional for general anæsthesia. Of all the cases in my series, none developed pulmonary complications. As regards reduction of mortality, the figures are too small to carry any conviction, but of all the 84 cases considered here, only four cases died—a mortality of 4·7 per cent., which compares favourably with the general mortality of the surgical cases of the same hospital, especially if it be taken in consideration that in many cases much more extensive operations were performed than would have been the case under general anæsthesia.

FIG. 10 A.

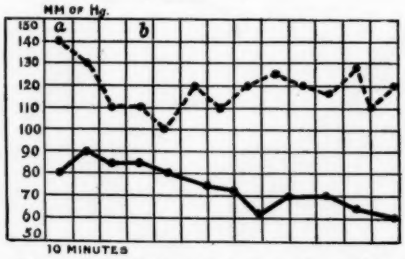


FIG. 10 A.—Partial gastrectomy, male, aged 60.

FIG. 10 B.

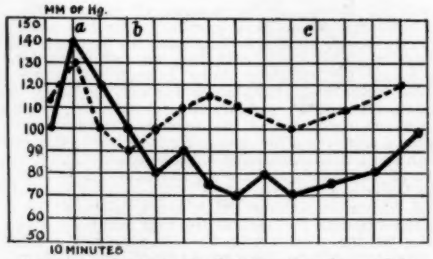


FIG. 10 B.—Right hemicolectomy, female, aged 31.

The thick line indicates pulse-rate and the dotted line shows blood pressure. (*a*) Induction of anæsthesia; (*b*) beginning of operation; (*c*) end of operation.

Disadvantages of the Method.

To the patient, even under the influence of morphine and scopolamine, the multiplicity of the punctures necessary for the induction of anæsthesia is irksome; repeated contact of the needle with the periosteum or nerve trunks is very trying. Also, the psychic element must be taken in consideration. The public, as well as the profession, has yet to become accustomed to regional anæsthesia. I am at present engaged in finding suitable doses and methods of administration of drugs which induce sleep and raise the blood pressure. I have reason to believe that, with suitable administration of chloralose or a similar drug, regional anæsthesia will become popularised. At present it is essential, as the patient is conscious, that absolute silence be maintained in the theatre; the patient must not see or hear the instruments; he must not be asked if he is being hurt—he will soon volunteer the information if he is.

To the surgeon there is the disadvantage at present to have to induce the anæsthesia himself, or to obtain the services of two anæsthetists. The surgeon must also understand that his technique must be adapted to regional methods. He must be gentle with intent, right through the operation. He must discriminate between complaints due to pain and those due to nervousness.

Although the toxicity of novocaine is very low, its use is sometimes followed by signs of intolerance; these have occurred in two cases: there were pallor, tachycardia, cyanosis of the finger-tips, and sweating. An injection of pituitrin or caffein quickly restores the patient's condition.

In one case, after a unilateral paravertebral from the sixth to the twelfth dorsal nerves, there was marked pallor of one-half of the face on the side of the injection, in great contrast with the flushed appearance of the opposite side; also the pulse at the wrist on that side was imperceptible, whilst on the opposite side the pulse was normal in volume and frequency; the general condition of the patient was good. In two cases, one paravertebral and one splanchnic, the blood pressure dropped suddenly during the induction, and respiration ceased. It was due to the inadvertent injection of novocaine into a blood-vessel. Both patients recovered.

One case of inoperable carcinoma of the liver and gall-bladder suddenly became unconscious at the end of the operation, and died 24 hours later without recovering consciousness.

Conclusion.

Regional anæsthesia has been in existence 20 years. From my personal observations of the method as used by Prof. Pauchet in Paris, from the experience of my own cases, and from the study of experiments on animals I am led to the conclusion that regional anæsthesia has its place not only as a life-saving measure in the surgery of the old, the feeble, and the diseased, but as a routine measure in numerous routine surgical procedures.

The experimental work was performed in the physiological laboratories of King's College, and I am indebted to Prof. McDowall for the facilities afforded, and his criticism of the work. Finally, I wish to thank Mr. Evans for the interest he took in the method since I began to use it; for his willingness to operate under regional anæsthesia, and for his help and encouragement on numerous occasions. And I take this opportunity to express my appreciation. My thanks are also due to Mr. Rock Carling, who used the method on 14 occasions, and to Mr. C. Price Thomas, for his constant and ungrudging help in the operating theatre, the physiological laboratory, and for the preparation of the dissections used to illustrate this lecture; and to Mr. Sewell, I am indebted for the illustrations.

Bibliography.

1. H. Sellheim: Verhandl. Deut. Gesel. Gynäk., 1905, p. 176.
2. A. Läwen: Paravert. Leit. Anaest., Munch. Med. Woch., 1911, lxviii., 1390.
3. H. Finsterer: Tech. Paravert. Leit. Anaest., Zeit. Chir., 1912, xxxix., 60.
4. M. Kappis: U. Leit. Anaest. b. Nieren Op., Zent. Ch., 1912, xxxix., 249.
5. M. Kappis: Der Gegenwart. örtl. Betäub., Zeitschr. Urol. Chir., 1922, x., 114.
6. P. W. Ziegel: Paravert. Anaest., Deut. Med. Woch., 1914, xl., 1416.
7. P. W. Ziegel: Erfahr. 2000 Paravert. An., Med. Klin., October, 1918.
8. F. Hartel: Lok. An., Neue Deut. Chir., 1916, xxi., 239.
9. V. Pauchet, Sourdat, Labat: L'An. Reg. (Doin, 1921).
10. Wendling: Thèse de Basle (quoted by Sourdat, Presse Méd., 1919, xxi., 193).
11. Naegeli: Splanch. An. b. Ch. Eingriff., Centr. f. Ch., 1919.
12. G. Labat: Spl. An., Brit. Jour. Surg., 1921, xxxi., 278.
13. G. Labat: Regional An. (Saunders, 1923).
14. O. S. Lawsley and W. S. Pugh: Jour. Amer. Med. Assoc. 1924, lxxxii., 13.
15. O. S. Hillman and R. E. Apperly: Proc. Roy. Soc. Med., March, 1925 (and this issue of THE LANCET).
16. Report of Trustees: Jour. Amer. Med. Assoc., 1924, p. 876.
17. C. A. Pannett: Anoci-Assoc., Brit. Jour. Surg., 1914, ii., 248.
18. Richet: Dict. de Physiol., 1895.
19. R. J. S. McDowall: Eff. An. on the Lungs., Brit. Med. Jour., Jan. 13th, 1923.

SPLANCHNIC ANALGESIA,

WITH RECORD OF NINETY-ONE CASES.*

I.—SURGICAL ASPECT.

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SURGICAL REGISTRAR, MIDDLESEX HOSPITAL.

II.—ANÆSTHETIC ASPECT.

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HON. ANÆSTHETIST TO THE ABOVE HOSPITAL.

I.—SURGICAL ASPECT. *By* Mr. HILLMAN.

THE principles of anoci-association as brought forward by Crile are known to you all and no doubt practised by many. That this method gives great advantages to both patient and surgeon there is, I think, no doubt, but as the method consists of the production of a local or infiltration anæsthesia in the operative field it has its limitations and perhaps disadvantages. I propose to put before you a method which is based on Crile's principles but differs in that the analgesia produced is regional and not local, and for this reason enables the method to be applied to the blocking of impulses passing from the abdominal viscera to the central nervous system.

Splanchnic analgesia consists in placing a block across the path of impulses passing from the viscera via the cœliac ganglia and the great splanchnic nerves to the central nervous system. This is done by placing a certain amount of 1 per cent. novocaine in the path of the splanchnic nerves.

Basic Principles.

It is necessary to show that splanchnic analgesia is based on sound principles. To do this I cannot do better than refer to an article by Prof. C. A. Pannett in the *British Journal of Surgery*, Vol. II. Prof. Pannett shows by animal experiments that novocaine placed in relation to the mesenteries of the viscera definitely protects the animal from shock produced by handling those viscera. He also shows that the rigidity of the abdominal wall in operations on the abdomen is considerably reduced when the mesenteries of the viscera operated upon are infiltrated with novocaine. This shows that the rigidity of the abdominal wall is not entirely due to irritation of the parietal nerves, and therefore injection of these nerves alone will not give the same relaxation as if the visceral nerves are blocked as well.

I am fortunate in having a clinical example of this. I was asked to give a splanchnic anæsthetic to a patient with a perforated gastric ulcer who was very ill. When I saw him he was groaning and writhing with pain and his abdominal wall was board-like. With great difficulty I succeeded in performing the injection, and when I turned him on to his back I was surprised to find him lying quite peacefully and apparently without pain. I spoke to him and he volunteered that all his pain had vanished. This gave me remarkable proof of the efficacy of the splanchnic block.

The important fact to be grasped from this is that afferent impulses do pass to the central nervous system from the viscera, and that these impulses can be interrupted by placing a block across the visceral nerves. This is the justification for splanchnic analgesia.

In the human subject the upper abdominal viscera are supplied by nerves through the great splanchnic nerves, which are derived from the fifth to the ninth or tenth dorsal nerves and also by the lesser and least splanchnic nerves which run in close proximity. These nerves pass through the crura of the diaphragm and are distributed to the various viscera via the cœliac ganglia. For the induction of splanchnic analgesia it is necessary to place novocaine in the path of these nerves, and this is done at the level of the first lumbar vertebra.

In order to complete the analgesia for an abdominal operation it is of course necessary to place a block across the paths of the nerves of the abdominal wall. This is done by performing an abdominal field block, the technique of which I described fully in my article on Splanchnic Analgesia in THE LANCET, July 5th, 1924.

Technique.

It is of course possible to operate under splanchnic analgesia alone, and when I commenced this procedure this was done with considerable success. This method must mean a considerable amount of psychic shock to the patient, it certainly entails a great deal of mental strain on the surgeon to perform a major operation on a conscious subject, and it certainly is more of a strain to perform the injection on a person who may move at any moment. For these reasons I changed the technique and now give the injection under light ether anæsthesia which is continued throughout the operation, so that the splanchnic injection is used as a means of reducing shock and reducing the amount of anæsthetic drug administered, both of which objects have been fully attained.

In my article quoted above, I gave a full description of the technique of the splanchnic injection, and in THE LANCET of July 12th (p. 70) I gave a description of the syringe that I had made for the purpose. Since then I have slightly modified the procedure, for instead of making the injection opposite the first and second lumbar vertebræ I now make it opposite the first only. In this way, after striking the first lumbar vertebra and getting the needle in the correct position 1 cm. beyond, an injection is made of 30 c.cm. of 1 per cent. novocaine, the needle is then withdrawn, and the same injection made on the other side. It will be seen, then, that the dose of novocaine has been reduced from 90 c.cm. for the splanchnic injection to 60 c.cm., and equally good results seem to be obtained.

The technique is not difficult, but it must be carried out in detail and with great care, and especially must aspiration *always* be done before injecting the novocaine, for, should that quantity of novocaine be discharged into the blood-stream, the result would be a fatality. It is essential for good results that the operator have a mental picture of where his needle is going; if he has not he cannot overcome any difficulties that may arise, and also he may become careless and forget that his needle is in a dangerous area.

It need hardly be pointed out that gentleness is essential. This is especially the case when making the injection on a conscious subject, though unconsciousness must be no excuse for roughness. If the bone be struck roughly the point of the needle will be turned and will tear the tissues on withdrawal, unnecessary shock will be caused, and in a conscious patient pain.

Advantages and Disadvantages.

I will now proceed to discuss the following points: (1) The advantages and the disadvantages to the surgeon; (2) the advantages and the disadvantages to the patient; (3) the effects on the pulse-rate and the blood pressure.

1. *Advantages to the Surgeon.*—The most striking phenomenon on watching a case under splanchnic anæsthesia is the smallness of the respiratory excursion as compared with those of a similar case under purely ether anæsthesia of as light a depth; this is, of course, of immense help to the operator. There is complete and perfect relaxation of the abdominal wall with a light depth of anæsthesia. There is complete absence of sudden straining on the part of the patient when any necessary traction is made. This is

* Delivered before the Section of Anæsthetics of the Royal Society of Medicine.

especially seen when operating on the gall-bladder and ducts. It is well recognised how difficult some patients can be when operations are carried out on the biliary tracts, straining and deep respirations occurring on the least traction: all this is eliminated if the splanchnic nerves have been successfully blocked. Lastly the surgeon is relieved of any anxiety, as he knows that his patient is receiving no shock, though this again must be no excuse for rough operating. The surgeon also is left with a free hand to do whatever he may think best for his patient, even though it involves a great deal of time and manipulation.

2. *Disadvantages to the Surgeon.*—These are, perhaps, two in number, though I think that they are easily overcome by the benefits that the patients derive. The first is the addition of 15 minutes to the time to anæsthetise the patient. This is the time that I now take to perform the injection, though at first, of course, it took longer. The second is the fact that if the operation be a long one the effect of the field block of the abdominal wall may wear off, though I think that this is really an error in technique than a real disadvantage. If this occurs it can readily be overcome by the coöperation of the anæsthetist, who, after the experience of a few cases, will recognise if deepening of the anæsthesia be needed or not.

3. *Advantages to the Patient.*—I will merely state what we consider these to be, leaving Dr. Apperly to deal with them in more detail: (1) The patient receives less anæsthetic drug; (2) there is the minimum of shock; (3) there is no fatigue from excessive respiratory excursions; (4) there is no "falling off" of the condition of the patient after return to the ward, as is so often the case after ether anæsthesia; (5) the day following operation the patient is in better condition owing to the absence of shock; (6) owing to the diminution of the amount of the anæsthetic drug administered there is less vomiting; (7) there is less liability to chest complications; (8) there appears to be less post-operative pain; (9) some patients who would be considered beyond surgical aid can be given the chance of an operation by means of splanchnic analgesia.

4. *Disadvantages to the Patient.*—In a few cases there has appeared to be a tendency to flatulent distension of the abdomen, but its incidence does not seem to be greatly increased. In one case a patient complained of severe neuralgic pain in the back. It was, however, never definitely established that the pain was due to the injection, though perhaps it is better to regard it as such. Some cases have suffered with severe headaches of two or three days' duration.

Effects on the Pulse-Rate and the Blood Pressure.

In a number of cases operated upon by Mr. Gordon-Taylor under splanchnic analgesia I have taken readings of the pulse-rates and blood pressures and from these readings prepared graphs. Most of the cases from which these graphs were obtained were partial gastrectomy cases, though some were laparotomies for suspected ulcers in which little was found, and only the appendix removed; however, whatever the operation, all the graphs show the same sequence of events. There is a distinct fall of blood pressure after the injection is made, this fall lasting on the average for 20 minutes; after this time the pressure steadily rises throughout the operation, until in about an hour's time it has reached the patient's normal level or even in many cases surpassed it. The fact that there is the same fall whether it is a severe operation or not, and that the pressure is higher at the end than at the beginning of the operation shows that the fall cannot be attributed to shock.

With regard to the pulse-rates, these in all cases show little variation from the normal, a fairly even rate being maintained throughout the operation. The striking point is that when the pressure falls the pulse-rate does not rise, sufficient proof that shock is absent and also that the fall in blood pressure is not dangerous.

Commentary on Cases.

I have now performed the splanchnic block on 49 cases; of these 38 were upper abdominal ones, and

TABLE I.—*Partial Gastrectomy Cases.*

—	Average pulse-rate after operation.	Immediate mortality (per cent.).	No. of blood transfusions.
Without splanchnic analgesia, 34 cases ..	111	12·9	14
With splanchnic analgesia, 31 cases ..	85	3·2	2

of the 38, 26 were partial gastrectomy cases. Of this series not one patient has developed any chest complication and only two died immediately after the operation. These two patients were so desperately

TABLE II.A.—*Mr. Hillman's Cases of Splanchnic Analgesia.*

No.	Age and sex.	Disease.	Operation.	Result.
1	43, M.	Pyloric ulc.	Partial gastrectomy.	R.
2	43, M.	Carc. pylorus.	" "	R.
3	—, M.	Gas.-jej. ulc.	" "	R.
4	46, F.	" "	" "	R.
5	42, F.	Gas. ulc.	" "	R.
6	56, M.	Carc. stom.	" "	R.
7	32, M.	Gas. ulc.	Total gastrectomy.	R.
8	47, F.	" "	Partial gastrectomy.	R.
9	35, M.	" "	" "	R.
10	46, M.	" "	" "	R.
11	60, F.	Pyloric ulc.	" "	R.
12	47, F.	Gas. ulc.	" "	D.
13	45, M.	Duod. ulc.	" "	R.
14	54, M.	Gas. ulc.	" "	R.
15	39, M.	Duod. ulc.	" "	R.
16	46, M.	" "	" "	R.
17	40, M.	Gas. ulc.	" "	R.
18	41, M.	" "	" "	R.
19	44, F.	" "	" "	R.
20	—, F.	Duod. ulc.	Sleeve resection.	R.
21	48, M.	" "	Partial gastrectomy.	R.
22	44, F.	Gas. ulc.	" "	D.
23	48, M.	" "	" "	R.
24	59, M.	" "	" "	R.
25	62, F.	" "	" "	R.
26	50, M.	" "	" "	R.
27	40, M.	Duod. ulc.	" "	R.
28	48, M.	Carc. duod.	Gastro-jej.	R.
29	67, F.	Carc. stom.	" "	R.
30	67, F.	Carc. panc.	" "	R.
		Pyloric sten.	Cholecyst-ent.	D.
		Chr. panc.	Gastro-jej.	
31	56, F.	Gall-stones.	Laparotomy.	R.
32	67, M.	" "	Cholecystectomy.	R.
33	55, F.	Chr. appx.	" "	R.
34	39, M.	" "	Appendectomy.	R.
35	—, M.	Gas. colic fistula.	Laparotomy.	D.
36	39, F.	Malig. ovary.	Ovariotomy.	R.
37	68, F.	Pelvic appx. abscess.	Drainage.	R.
38	—, F.	Old gas.-jej.	Laparotomy.	R.
39	53, F.	Adhesions.	Band divided.	R.
40	41, M.	Chr. appdx.	Appendectomy.	R.
41	33, F.	" "	" "	R.
42	53, M.	Perf. gas. ulc.	Ulcer closed.	D.
43	29, M.	Old gas.-jej.	Adhesions cut. Appendectomy.	R.
44	26, M.	Splenic anæmia.	Splenectomy.	R.
45	53, F.	Gas. ulc.	Gas.-jej.	R.
46	60, F.	Carc. panc.	Cholecystenterostomy.	R.
47	65, M.	Carc. cæcum.	Ileo-colostomy.	D.
48	—, F.	Cholecystitis.	Bile-duct drained.	D.

Total number of cases, 48; number of gastrectomies, 26; no post-operative pulmonary complications.

Comments.—(1) 25 min.; no anæsthetic. (2) 6 drms. chloroform. (3) Operation 2 hr. 20 min. (4) Operation 2 hr. 15 min. (6) Very poor subject. (7) Very wasted, anæmic, paravertebral. (8) Pain in back after. (9) 1 hr. 20 min.; no anæsthetic. Tubercle. (10) and (11) Paravertebral. (12) Died 8 hr. after. Bad hæmatemesis case. (14) Hæmatemesis 2 days; blood transfusion. (21) Fatty heart; nephritis. (22) Told carc. before. (27) Paravertebral. (28) No anæsthetic. Said felt no pain. (29) Very ill and weak. (30) Died five days after. (32) Paravertebral. (33) Right side only. (35) Died shortly after. (36) 3 drms. ether. (37) Chloroform, 2 drms. (42) Died 5 days after; peritonitis. (46) Paravertebral. (47) Died 5 days after. (48) Died 3 days after; heart failure.

ill that it was only the fact that splanchnic analgesia could be used that enabled them to be given the faint chance of an operation. That is to say, that out of 49 cases there were no chest complications and no deaths from shock, although the series contains some very difficult upper abdominal cases and that at least one patient had a very definite bronchitis and one a tuberculous lesion of the lung on account of which he had been refused operation at another hospital.

A comparison of 31 cases of partial gastrectomy with and without splanchnic analgesia is interesting. This shows that the average pulse-rate after operation has dropped by 26 and the deaths from shock to have been reduced from 12·9 per cent. to 3·2 per cent. (the one death being one of the desperate cases mentioned). Table I. shows that the number of blood transfusions has fallen from 14 to 2, and in both the latter it was given for previous hæmatemesis and not for shock.

I trust that I have shown that splanchnic analgesia has a definite value in abdominal surgery. I do not think that all upper abdominal cases need it, though I think that they are all the better for it. In the case of gastric surgery, however, where the extent of the lesion is always doubtful until the abdomen is opened, I do suggest that the surgeon will be happier in what he does if he knows that the splanchnic nerves are blocked. Therefore for these cases I suggest that splanchnic analgesia should be induced as a routine, and be combined with as little general anæsthetic as possible. In this way shock will be overcome and the chance of the patient developing a chest complication will be reduced to a minimum.

TABLE II.B.—*Dr. Apperly's Cases of Splanchnic Analgesia.*

No.	Age and sex.	Disease.	Operation.	Result.
1	56, M.	Gas. ulc.	Partial gastrectomy.	R.
2	51, F.	Abscess in abd. wall.	Exploration.	R.
3	36, F.	Cholecystitis.	Cholecystectomy.	R.
4	57, M.	Gas. ulc.	Partial gastrectomy.	R.
5	42, F.	Appendicitis.	Explor. lapar. Appendectomy.	R.
6	58, M.	Gas. ulc.	Partial gastrectomy.	R.
7	38, F.	,, ,,	,, ,,	R.
8	42, M.	Carc. stom.	Gas.-jej.	R.
9	43, F.	Cholecystitis.	Cholecystectomy.	R.
10	77, F.	Carc. stom.	Gas.-jej.	R.
11	48, M.	Duod. ulc.	,, ,,	R.
12	44, F.	Gas. ulc.	Partial gastrectomy.	R.
13	60, M.	Cholecystitis.	Cholecystectomy.	R.
14	38, M.	Duod. ulc.	Gas.-jej.	R.
15	50, M.	Gas.-jej. ulc.	Partial gastrectomy.	R.
16	28, M.	,, ,,	,, ,,	R.
17	57, M.	Gas. ulc.	Cautery to ulc.; ligature of vessel.	R.
18	36, M.	,, ,,	Partial gastrectomy.	R.
19	69, F.	,, ,,	,, ,,	D.
20	67, F.	Carc. stom.	Laparotomy.	D.
21	53, F.	,, ,,	Gas.-jej.	R.
22	45, F.	Duod. ulc.	Gas. duod.	R.
23	51, M.	Gas. ulc.	Partial gastrectomy.	R.
24	36, M.	,, ,,	,, ,,	R.
25	50, M.	Appd.	Laparotomy and appendectomy.	R.
26	50, M.	Carc. stom.	Laparotomy.	R.
27	48, M.	Cholecystitis.	Cholecystectomy.	R.
28	58, M.	Gas. ulc.	Partial gastrectomy.	R.
29	53, F.	Adhesions, appendicitis.	Appendectomy.	R.
30	58, M.	Cholecystitis.	Cholecystectomy.	R.
31	24, M.	Duod. ulc.	Gas. duod.	R.
32	59, M.	Malig. glands in abdomen.	Laparotomy.	R.
33	45, M.	Gas. ulc.	Partial gastrectomy.	R.
34	52, M.	Carc. stom.	Laparotomy.	R.
35	24, M.	Splenic anæmia.	Splenectomy.	R.
36	50, M.	Gas. ulc.	Partial gastrectomy.	R.
37	44, M.	,, ,,	,, ,,	R.
38	37, F.	Adhesions.	Laparotomy.	R.
39	51, M.	Malig. disease of colon and small intestine.	Ilio-colostomy; cæcostomy.	D.
40	52, F.	Cholecystitis.	Cholecystectomy.	R.
41	59, M.	Gas. ulc.	Partial gastrectomy.	D.
42	55, M.	,, ,,	,, ,,	D.
43	64, M.	Cholecystitis.	Cholecystectomy.	R.

Total number of cases, 43; gastrectomies, 17; cholecystectomies, 7.

Comments.—(2) Later developed pyelitis. (4) Headache. (5) Headache for two days. (6) Emphysema and bronchitis. (7) Hæmatemesis. (9) Rt. splanchnic and double paravertebral. (12) Paravertebral. (13) Very bad asthma and bronchitis. Rt. splanchnic. (15) 2 hr. 20 min. (16) 2 hr. 15 min. (17) Hæmatemesis. (18) Headache and backache two days. (19) Died 14 days. (20) Died eight weeks. (22) Headache. (25) Cirrhosis of liver. (30) Bad bronchitis and emphysema. (39) Died ninth day. Hæmorrhage into bowel from growth. (41) Died fourth day. Broncho-pneumonia. (42) Died fifth day. Hæmorrhage from suture line.

In conclusion, I wish to express my gratitude to Mr. Gordon-Taylor for his encouragement, and especially his patience, during my early trials, and also for his permission to base this paper on the cases that he has operated upon. I would also like to acknowledge the keenness with which the honorary anæsthetists of the Middlesex Hospital coöperated with me in this work.

II.—ANÆSTHETIC ASPECT. *By* Dr. APPERLY.

One cannot help feeling that some anæsthetists have in the past rather looked askance at, if not almost resented, the introduction of any method of regional or local anæsthesia. One reason for this may be the dislike common to most of us, particularly as we get older and perhaps busier, of making the effort involved in mastering a new technique and shouldering a new anxiety. However that may be, the fact remains that few anæsthetists in this country use regional methods, and many still even leave spinal anæsthesia to be done by the surgeon if the case requires it.

Had it not been for the constant help and encouragement of Mr. Gordon-Taylor and Mr. Hillman, and my other surgical colleagues at the Middlesex Hospital, I should not have had the courage to attempt splanchnic block and other methods of regional anæsthesia. Since we first tried it, Mr. Hillman or myself have done a splanchnic block with abdominal field block in every gastric case which has passed through our hands in which a partial gastrectomy was anticipated, and also, as our lists show, in other operations in the upper abdomen which we thought presented special surgical difficulties, or where the patient suffered from chest complications.

I personally have no longer any doubt that combined regional and general anæsthesia will in the future be very largely used in all the more extensive surgical procedures. It is already used in abdominal-perineal excision of the rectum, Wertheim's hysterectomy, and often in prostatectomy; and recently we have used it with success in block dissections of the neck. I consider that the anæsthetist is the most desirable person to give the regional, as well as the general, anæsthetic. In a big case the surgeon has quite enough to worry him without having to attend to part of the anæsthetic arrangements, and few patients in private practice would like to pay the fees of both a regional and general anæsthetist. I would therefore urge anæsthetists to take a greater interest in regional methods as an addition to, rather than a substitute for, their present armamentarium.

Perhaps the greatest drawback to regional anæsthesia is the time taken in doing it. This particularly applies to hospital work, where a busy surgeon, with much to do and little time to do it in, may unconsciously discourage the anæsthetist from undertaking any new work because of the extra time involved. I am, however, sure that in some cases the results obtained by combined regional and general anæsthesia are so strikingly good as to justify the extra time taken, and besides, as the anæsthetist becomes more experienced in the method, the time taken is very greatly shortened.

Technique.

Splanchnic anæsthesia presents no great difficulties from the anæsthetist's point of view, provided the method has been practised sufficiently in the post-mortem room, and the technique which Mr. Hillman has described is carried out in every detail. In the first few cases no general anæsthetic was used except towards the end of the operation, by which time

the abdominal field block was wearing off, and a little general anæsthetic was given for stitching up the abdominal wall.

In these cases morphine gr. ¼, scopolamine 1/100, was given one and a half hours before operation and morphine gr. ¼, scopolamine 1/200 half an hour before. We quickly found, however, that a light general anæsthesia throughout did no harm, but had the following distinct advantages. (1) There was no need for the large preliminary dose of morphine and scopolamine which was almost a necessity if no general anæsthetic was given. (2) The splanchnic block was made much easier, took less time, and was, of course, painless. (3) Towards the end of a large operation, when the field block is wearing off, the anæsthesia can be quickly deepened and the closure of the abdominal wound facilitated. (4) Psychic shock was abolished. (5) The strain on the surgeon, to say nothing of the anæsthetist, is lessened if they are dealing with an unconscious patient.

Therefore after the first few cases the anæsthetic technique has been as follows: Morphine gr. ¼ or ⅓, atropine gr. 1/100, was given three-quarters of an hour before operation. General anæsthesia was induced, either gas and ether or chloroform and ether, and the splanchnic and abdominal field block then done in the anæsthetic room. Directly that is done, generally occupying about 20 minutes to half an hour, the patient is taken into the theatre, and general anæsthesia maintained with ether and oxygen, or chloroform and ether and oxygen. The abdominal incision should not be made until five minutes after the abdominal field block is finished.

Effect on Blood Pressure.

The blood pressure commences to fall shortly after the first splanchnic injection and reaches its minimum at the end of about half an hour, from which time it commences to rise again until by the end of one hour it is, as a rule, actually back to what it was before operation. In other words, the fall in blood pressure is of very short duration. It may be well to mention that it is extremely important to move the patient gently after the injections are made, and to avoid raising the shoulders too high, otherwise the blood pressure may fall very rapidly.

In private practice, of course, the anæsthetist, after inducing anæsthesia, has to call to his aid the doctor of the case or the surgeon's assistant to maintain a light anæsthesia while the regional blocks are done. It is extraordinary how light an anæsthesia can be maintained after the first injection. Patients who have been difficult during induction become quite placid, presumably owing to the fall of blood pressure. I would emphasise the point that the regional blocks cannot be hurried, but to be successful must be slowly and deliberately done. The anæsthetist will be aware of the success or otherwise of the splanchnic anæsthesia directly the surgeon handles abdominal contents. If the splanchnic block is effective the breathing should neither alter in rhythm or rate, even when considerable traction is put on any of the contents of the upper abdomen and the general anæsthesia is light.

With splanchnic anæsthesia, as in all other forms of regional or local anæsthesia, even when accompanied by light general anæsthesia, if the best results are to be obtained, there must be coöperation between the anæsthetist and surgeon. The anæsthetist must ascertain the exact position of the incision the surgeon proposes to make before doing his field block and even make his area of anæsthesia sufficiently wide to allow of a slight extension of the wound if necessary. On the other hand, the surgeon must not stray outside the anæsthetic area without warning the anæsthetist first, so that the nerve block may be extended or the anæsthesia deepened. In the same way heavy retractors used too forcibly or muscle torn instead of cut may pull on tissues outside the blocked area, and render a deepening of the general anæsthesia necessary, and then part of the benefit of the nerve block may be lost. One of the great advantages of the method is the quiet respiration and absence of movement of the abdominal contents; but once this is disturbed it is often difficult to restore it again. Thus the sudden thrusting of a hand without warning into the pelvis—an unanæsthetised area—in the course of an operation on the upper abdomen may create difficulties for both surgeon and anæsthetist.

It cannot be too strongly urged on the surgeon who wishes to get the best results from regional anæsthesia that gentleness in the treatment of the tissues is absolutely essential. In dealing with the advantages and disadvantages as we think of the method, I should like to take the disadvantages first.

Disadvantages of the Method.

1. *Fall of Blood Pressure.*—The blood pressure tracings demonstrate that the blood pressure falls often very considerably and very rapidly, but in only one case has it caused any anxiety whatever. It was in a case of cholecystectomy, where the patient's shoulders were lifted very suddenly in order that an air-cushion should be placed under the back. The anxiety, however, was very short-lived, as was the fall in blood pressure. However, this case taught us to exercise care in moving patients after the splanchnic injection has been made. Bearing this disadvantage in mind, we think that in cases where the patient has a very low blood pressure or where the circulation has been recently depleted by a gastric or duodenal hæmorrhage, it is wise perhaps to reduce the amount of novocaine used. One can reduce the amount used in the splanchnic block, say, to 20 c.cm. in each side, and that in the abdominal field block by using ½ per cent. instead of the usual 1 per cent. solution.

2. The second disadvantage we have found is *post-operative headache and backache.* Six or seven of our cases have suffered more or less severely from headache and backache. We have been rather at a loss to explain this, as although our technique has been practically the same throughout all the series, we have not had this complication arise in the last 40 odd cases. It is true we have become more dexterous with the needle and therefore have not damaged tissues to the same extent, but we cannot think that has been the real cause.

We thought that the fall in blood pressure might account for it; but in those cases in which the fall of blood pressure has been most marked there has been no headache. We think therefore that probably the real explanation of the disappearance of this disagreeable complication may be in the fact that we have latterly used a smaller amount of novocaine in our splanchnic block. One other possible explanation of the headache has occurred to me in that it resembles closely the headache which occurs after spinal puncture. In our earlier cases, on a few occasions, we tapped the spinal theca or a prolongation along the nerve, and cerebro-spinal fluid escaped, and this error in technique might furnish an explanation, especially as this complication has not arisen as we become more expert.

3. *Time Taken in Doing the Nerve Block.*—As I pointed out before, this is an undoubted disadvantage, especially in hospital practice. But if the mortality in severe operations in the upper abdomen is lowered by the use of splanchnic anæsthesia, as we think it is, no one will grudge the extra half an hour spent in the anæsthetic room.

4. One other slight complication has arisen in two of our cases which in fairness must be recorded. They were bad gastric cases where the stomach was not entirely empty. The cardiac sphincter being relaxed by the splanchnic block, when the stomach was handled by the surgeon gastric contents commenced to regurgitate. The passing of a stomach-tube was, however, difficult, as the patient was under very light general anæsthesia, and its introduction was at once resented. In neither case, however, did any harm result.

Advantages of the Method.

1. *Absence of Post-operative Pulmonary Complications.*—In our combined cases—numbering 91—we have only had one case in which there has been any post-operative lung complication. We think this is distinctly good in so large a series of upper abdominal operations. It, however, becomes strikingly good, if we take into consideration the fact that a number of the gall-bladder cases and some of those in which gastro-jejunostomy was performed were done by this method at the request of our surgical colleagues, owing to the existence of bronchitis or some other pulmonary complication. In none of these cases was the chest condition appreciably aggravated by their operation.

The one pulmonary complication which occurred was in the forty-first of my cases. The patient was a man of 59 on whom a partial gastrectomy was performed for a large gastric ulcer high up in the lesser curvature. It was a very difficult case and the patient was in the theatre 1 hour and 35 minutes. He developed broncho-pneumonia on the second and died on the fourth day. He had extensive broncho-pneumonia of both lower lobes. He was medically a very fit and suitable subject for operation, which makes his case the more disappointing. On the whole, therefore, we think that perhaps the most striking advantage of the splanchnic and abdominal field block from the anæsthetist's point of view is the absence of pulmonary complications in a class of case which has in the past been particularly prone to them.

2. *Quiet respiration* and diminished abdominal movement with which it is associated. This, as Mr. Hillman has pointed out, is a great help to the surgeon. It is, however, equally important from the anæsthetist's point of view, as quiet respiration does not exhaust the patient, a very important point if the operation be a lengthy one and the patient past middle life. In elderly patients with emphysema and bronchitis I am sure it is a most potent factor in preventing post-operative lung complications.

3. *Perfect relaxation* for which, of course, one relies entirely on the nerve blocks, until perhaps the closing of the abdominal wall in a long case.

4. *Small Amount of General Anæsthetic Used.*—I count this as an advantage, not from the point of view of the anæsthetist's pocket, but from the fact that the patient is very little upset after operation, and sickness is very greatly reduced.

In trying to give this unbiased account of our work we do not pretend that the method should be adopted in every operation on the upper abdomen, but we do suggest that it has been the means of saving the lives of some of the patients on our lists and enabled operations to be performed on others which would not have been attempted under general anæsthesia alone.

In conclusion, I have to acknowledge my indebtedness to Mr. Gordon-Taylor, Mr. Webb, and my other colleagues at the Middlesex Hospital for their patience, encouragement, and help.

YORKSHIRE'S CRIPPLED CHILDREN.—It is estimated that there are in Yorkshire 5000 children of school age needing orthopædic treatment, but the existing hospitals in the county can receive only 250. The position will shortly be eased by the provision of a new orthopædic hospital at Kirbymoorside, where there is an ex-Servicemen's Red Cross hospital, consisting of army huts and a stone bungalow. These buildings, which are in sound condition, have been presented by Mrs. Edward Shaw, of Welburn Manor, and the Right Hon. J. R. Ferens, of Hull, has given £5000. The new hospital has room for 100 beds and there is sufficient land to allow of considerable expansion. The income will be derived mainly from payments by local authorities in respect of patients sent by them.

APLASTIC ANÆMIA FOLLOWING TREATMENT WITH X RAYS.

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FROM time to time cases have been described amongst workers with X rays and with radium, where the prolonged exposure to the rays has produced very severe blood changes with a fatal result. One of the earliest cases was that of an Italian worker, who had for 14 years been accustomed to work with a very hard focus tube, and who took little precaution for his protection.[1]

Mottram (1920), in a paper[2] dealing with the leucocytic blood content of individuals working with radium, describes a diminution in the number of red cells with a high colour-index. In his later paper[3] he reports three cases of profound anæmia with a fatal termination after an illness of a few months. Larkin (1921) reports[4] a case of acute aplastic anæmia in a man of 43, who had been working at radiography for 15 to 18 years. Faber (1923) not only quotes the above cases, but gives[5] a description of another case, and points out the similarity of the blood changes in the series. No post-mortem examinations were done in any of these except in the Italian case.

		R.B.C.	C.I.	W.B.C.	P. (%)	L. (%)
Mottram's cases.	(1)	1,100,000	0·68	1000	50	50
	(2)	800,000	1·3	1520	48	52
	(3)	527,500	0·84	850	13·5	40·5
Larkin's case		1,000,000	0·9	840	41	58
Faber's case		1,250,000	1	2000	L*	L*

R.B.C., red blood corpuscles. C.I., colour-index. W.B.C., white blood corpuscles. P., polymorphs. L., lymphocytes. L*, mostly lymphocytes in film.

In the first and fourth cases in the above series the colour-index at some time in the course of the disease had been 1 or over. The above cases presumably possessed normal hæmatopoietic organs at the outset.

The therapeutic action of radiation in blood diseases is of extreme interest. Both X ray and radium have now been given an extensive trial in treatment of the leukæmias, and it is generally held that life is prolonged by the use of one or other of these forms of radiation. Gilbert,[6] as long ago as 1914, published a thesis on the treatment of splenomedullary leukæmia by radium. He stated that the cure was not stable, that signs of leukæmia returned after some weeks had passed, and that with radium treatment after this relapse the number of the leucocytes diminishes less rapidly and the curative action is less effective than when used at first. Peabody,[7] three years later, reports on 36 cases treated, stating that there was general clinical improvement, rapid decrease in the size of the spleen, and that the leucocytes were reduced. Brant[8] states that the Rontgen ray does not cure leukæmia, but that it improves the general condition, restores the earning capacity, and has a favourable action on the erythrocytes. Schreiner and Mattick[9] regard deep Rontgen ray and radium as essentially the same, which view was also expressed by Gulland,[10] who endorsed the views of other workers, stating "all cases relapse after a longer or shorter time. . . . In the long run all cases die of the disease or of an intercurrent affection, but I feel sure that the average length of life is greater than it was before radiation became general, or than it is with any other form of treatment." Gulland further emphasises the need of frequent blood examinations during treatment. He stated that it is quite easy to carry radiation too far, and to produce a condition closely resembling pernicious anæmia with a high colour-index, numerous megaloblasts, and a low red count. This he regards as due to interference with the normoblastic function

of the marrow, and remarked that radiation, if persisted in, would perhaps in the end lead to an aplastic anæmia. He added that he had never seen it progress so far. He stops treatment by radiation with a leucocyte count of 20,000, since the effect goes on for some time after radiation has been stopped.

A case is reported by Whitcher [11] in which radium treatment did produce an aplastic anæmia. A summary of his case is of interest, since it shows a close analogy with the case of aplastic anæmia following X ray reported later in this paper.

Clinical Records.

CASE 1.—A boy, aged 14, first took ill in July, 1919, Splenomedullary leukæmia was not diagnosed until April. 1920, when the liver and spleen were both enlarged, the spleen reaching to within 25 cm. of the symphysis pubis. The blood count was typical: R.B.C., 3,150,000 per c.mm.; Hb, 50 per cent.; W.B.C., 164,800, with excess of myelocytes, &c., in the film.

Radium treatment was given at monthly intervals until June, 1921, when the white count was 11,000 per c.mm. The patient was not under observation for the next two months. On Sept. 1st, 1921, the white count was 69,900 per c.mm., with a greater percentage of myelocytes than lymphocytes in the films. Radiation treatment was given that day and the count fell to 20,000 per c.mm. on Sept. 8th. Another treatment was given, and on the 29th it was found that the number of leucocytes had risen to 58,000 per c.mm. with a percentage of 58 lymphocytes in the films. The boy was readmitted to hospital with severe dyspnœa and weakness with irregular fever.

On Oct. 18th the blood count was: R.B.C., 1,148,000 per cmm.; Hb, 23·5 per cent.; C.I., 1·06; W.B.C., 310. A blood transfusion was given but with little benefit. On Nov. 1st his blood count was: R.B.C., 1,252,000 per c.mm.; Hb, 24 per cent.; C.I., 1; W.B.C., 380 (polymorphs, 18 per cent.; lymphocytes, 70 per cent.; basophiles, 12 per cent.).

This last count, taken just before death, is similar to those cases of aplastic anæmia among X ray and radium workers just quoted. The case is, moreover, very similar to the following:—

CASE 2.—A boy, aged 11 years, was admitted to Paddington Green Children's Hospital on April 11th, 1924. A history of influenza eight weeks previously, with subsequent loss of weight and pallor, was given. The immediate cause of admission was an attack of painful priapism; he had also complained of vague pains in the head and abdomen. On admission the boy was thin and pale. There was slight glandular enlargement. The spleen was enlarged to below the crest of the ilium. A blood examination was made resulting as follows: R.B.C., 1,870,000; Hb, 36 per cent.; C.I., 1; W.B.C., 643,000. The films showed a few normoblasts. The majority of the white cells were of the bone-marrow type, and a diagnosis of splenomedullary leukæmia was made. During the next fortnight the priapism persisted. There was irregular fever, the evening temperature averaging 100° F., the morning 98·6°. Benzol m 5 in capsule was given daily. The spleen diminished slightly in size. Dr. Pierce Williams showed the case at the Royal Society of Medicine, and I am indebted to him for the notes up to this point.

On April 30th the patient was transferred to St. Mary's Hospital. On admission the spleen was palpable 3 inches below and 1 inch to the right of the umbilicus. The inguinal glands were hard but not enlarged, the axillary glands were not palpable. The superficial veins were easily seen. The first of the series of blood counts done in this department gave figures: R.B.C., 1,656,000; Hb, 24 per cent.; C.I., 0·72; W.B.C., 1,016,000 (see Table II.). Normoblasts were present in the film.

During his stay in the hospital until August 8th, X ray treatments were given on the dates as in Table I. The fall in the number of white corpuscles is also shown. The second table shows the changes in the percentage and total number of the white cells in the differential count. On August 8th the patient was sent to a convalescent home for six weeks. On his return he attended the out-patient department. On Oct. 1st his general condition was much improved. The spleen was much decreased in size and his blood count showed: R.B.C., 4,592,000; Hb, 64 per cent.; W.B.C., 82,000.

TABLE I. (Case 2).

Date in 1924.	X ray treatment. (Pastille dose.)	White cells per c.mm.
May 1st	1 mm. AL 1/2 B.	1,016,000
,, 8th	—	1,055,000
,, 13th	1 mm. AL 1/2 B.	—
,, 23rd	3 mm. AL 4/5 B.	—
,, 27th	—	482,000
June 6th	—	508,000
,, 12th	3 mm. AL 4/5	—
July 1st	—	416,000
,, 3rd	3 mm. AL 4/5	—
,, 29th	,, ,, 4/5	—
Sept. 9th	,, ,, 4/5	—
Oct. 1st	—	82,000
,, 7th	3 mm. AL 4/5	—
,, 13th	—	9,000
Nov. 13th	3 mm. AL 4/5	12,000
,, 24th	—	1,300
Dec. 15th	—	900

X ray treatments were continued. After that of Oct. 7th the patient complained of headache and vomited his food. After the next, headache and vomiting lasted four days. The vomiting later became persistent and the boy was readmitted on Dec. 11th. He was very wasted and pale. The skin over the abdomen was pigmented. There was some rigidity of the abdominal muscles. The liver was palpable about 2 inches below the costal margin, and the spleen was hard on palpation and reached a point half an inch above the inter-tubercular line. He was dyspnœic and very weak. On the 13th his temperature rose to 103° F. and remained high. The blood count done on the 15th gave the very low figures: R.B.C., 622,000; Hb, 12 per cent.; W.B.C., 900. He was given a blood transfusion, which improved his condition temporarily, but the next day his temperature rose again to 102° and remained high until he died on the 22nd.

Post-mortem Examination.—The body was very much wasted; there was extreme pallor of all the mucous membranes; the skin over the abdomen was pigmented—deeply on the right side; there were a few petechiæ over the shins and round the ankles. Heart showed numerous subpericardial hæmorrhages; pericardium contained 2 oz.

TABLE II. (Case 2).

Date in 1924.	Total R.B.C.	Hæmoglobin.	Colour Index.	Total W.B.C.	Myeloblasts.	Promyelocytes.	Myelocytes.		Polymorphonuclear.			Lymphocytes.		Hyalines.
							Neutrophile.	Eosinophile.	Neutrophile.	Eosinophile.	Basophile.	Small.	Large.	
May 1st	1,656,000	24%	0·72	1,016,000	0	20,320	254,000	60,960	548,640	50,800	81,280	0	0	0
					0%	2%	25%	6%	54%	5%	8%	0%	0%	0%
,, 27th	2,608,000	44%	0·84	482,000	9,640	24,100	121,220	14,460	279,560	19,280	33,740	0	0	0
					2%	5%	21%	3%	58%	4%	7%	0%	0%	0%
June 6th	2,856,000	36%	0·63	508,000	10,160	10,160	121,920	15,240	294,640	25,400	25,400	5,080	0	0
					2%	2%	24%	3%	58%	5%	5%	1%	0%	0%
July 1st	2,448,000	44%	0·9	416,000	12,480	0	112,320	8,320	257,920	16,640	4,160	4,160	0	0
					3%	0%	27%	2%	62%	4%	1%	1%	0%	0%
Oct. 1st	4,592,000	64%	0·7	82,000	1,640	820	13,120	1,640	56,580	2,460	4,920	0	0	820
					2%	1%	16%	2%	69%	3%	6%	0%	0%	1%
,, 13th	—	—	—	9,000	0	0	855	0	6,637	157	518	608	135	90
					0%	0%	9·5%	0%	73·75%	1·75%	5·75%	6·75%	1·5%	1%
Nov. 24th	2,984,000	45%	0·76	1,300	0	0	52	0	971	0	17	173	52	35
					0%	0%	4%	0%	74·7%	0%	1·3%	13·3%	4%	2·7%
Dec. 15th	622,000	12%	1·0	900	0	0	18	0	360	0	0	432	72	18
					0%	0%	2%	0%	40%	0%	0%	48%	8%	2%

of clear straw-coloured fluid; right auricle was much dilated; right ventricle slightly dilated; chambers contained a little tenacious clot; valves normal; myocardium showed very pronounced "tigering" in both ventricles, most in left. Microscopically there was patchy fatty degeneration of the muscle fibres, mostly under the endocardium; numerous small extravasations of blood under pericardium and in substance of myocardium; there were patches where the muscle-fibres, with poorly staining nuclei, stained deeply and uniformly with eosin, possibly areas of coagulation necrosis due to capillary thrombosis, such as is described in the bone marrow; aorta and blood-vessels normal; internal jugular and larger veins distended with blood. Lungs, pale, some œdema; a few small areas of hæmorrhage scattered through substance of lung; numerous sub-pleural hæmorrhagic spots. Microscopically, some areas showed

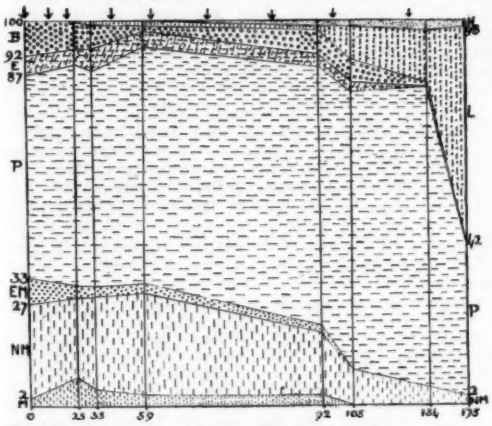

Diagram to show variations in differential count. Horizontal line represents time, numbers indicating days after beginning treatment. Vertical lines, numbers of various cells present in 100 cells. Arrows indicate dates of X ray treatments. M = myeloblasts and promyelocytes. NM = neutrophile myelocytes. EM = eosinophile myelocytes. P = polymorphonuclears. E = eosinophile polymorphs. B = basophile polymorphs. L = lymphocytes. H = hyalines.

hyaline thrombi in the blood-vessels, with areas of extravasation of blood into the alveoli, some recent, some presumably older, with hyaline change. Stomach showed some submucous hæmorrhages. Liver slightly enlarged; surface mottled; cut surface pale; sections showed central cells of lobules to contain much fat; there was no leucocytic infiltration; no free iron. Spleen weighed 275 gm.; firm; capsule thickened and opaque; cut surface increased fibrous tissue; no Malpighian corpuscles visible; pulp dark in colour. Microscopically, increase of fibrous tissue mainly round the small vessels with deposit of brown pigment containing free iron; blood spaces dilated; large phagocytic cells scattered in the sinuses, some loaded with iron-containing pigment. The pulp contained few cells, amongst which were only a few scattered myelocytes. Tonsils, enlarged; pus in crypts. Microscopically numerous areas having typical histological structure of bone marrow. Lymph glands, slight general enlargement. Microscopically normal, but containing a few scattered myelocytes; no areas comparable to marrow tissue found in tonsils. Bone marrow: that of ribs red in colour; that of femur a uniform pinkish colour throughout; tough and gelatinous in consistency. Microscopically showed profound changes; fine fibrosis throughout; only a few minute scattered islands of bone marrow cells; the scanty cells present in other parts are elongated cells, some containing free iron; in some areas thrombosis of the capillaries.

This patient was originally admitted to St. Mary's Hospital under Sir William Willcox, and was later under the care of Dr. Reginald Miller, to both of whom I am indebted for permission to record the case.

Summary.

The blood examinations made during the earlier stages of this case leave no doubt that the boy was a typical case of splenomedullary leukæmia. At one time the improvement of his general condition was considerable (Oct. 1st, 1924). Later the blood picture changed rapidly. On Oct. 13th, unfortunately, no red blood count was done, but the white count was normal (9000) and the numbers of abnormal cells had fallen considerably. No counts after that of July 1st, 1924, showed any nucleated red corpuscles, which had been noted on previous occasions. The blood picture on Dec. 15th, 1924, was that of a severe aplastic anæmia, confirmed at autopsy.

The post-mortem findings in this case are remarkably like those reported by Whitcher. He, however, describes the bone marrow as being dark red, and microscopically containing numerous non-granular mononuclear cells. No fibrosis is described. Whitcher also describes some areas in the liver where the intercellular channels were distended into spaces which he presumes formerly contained myelocytes.

Spontaneous termination in anæmia of an aplastic type has not been described as taking place in cases of splenomedullary leukæmia. Both these cases seem to show that radiation either with X ray or radium may convert a case into aplastic anæmia. As is generally held, improvement takes place with the treatment, but it is only temporary and a relapse is to be expected. Exact details of the mode of termination of such cases after relapse are not often given. Whitcher's case shows a rapidly progressive aplastic anæmia. The two cases reported by Broadbent,[12] where the temporary improvement was followed by a further rise of the white cells and rapid termination, were regarded as a terminal acute lymphatic leukæmia. It seems probable that, as Letheby Tidy[13] pointed out, the abnormal cells were myeloblasts and that the termination was the recognised "myeloblastic" one. Such cases could be explained by supposing that the bone marrow was not so damaged as in the case now recorded, and could still respond to the unknown stimulus which produces the blood changes of splenomedullary leukæmia. On cessation of radiation the bone marrow did so respond.

It is obvious that more work needs to be done before the optimum dosage of radiation is fully known, before it is determined at what point the treatment should be suspended. The total number of white cells alone does not seem to be sufficient indication of the progress of treatment. The proportion of abnormal cells and any fall in the red count should be carefully taken into consideration.

References.

1. Arch. of Roentgen Ray, 1914, xviii., 393.
2. Mottram: Arch. of Rad. and Electrother., December, 1920.
3. Same author: Ibid., May, 1921.
4. Larkin: Ibid., May, 1921.
5. Faber: Ugeskrift for Laeger, Copenhagen, Jan. 4th, 1923.
6. Gilbert: La radium therapie dans les leucemes myeloides, Paris, 1914.
7. Peabody: Boston Med. and Surg. Jour., Dec. 20th, 1917.
8. Brant: Norsk Mag. f. Laegevidenskaber, Christiania, 1923, lxxxiv., p. 761–848.
9. Schreiner and Mattick: Amer. Jour. of Roentgen and Rad. Ther., 1924, xii., No. 2.
10. Gulland: Brit. Med. Jour., 1921, ii., 273.
11. Whitcher: Boston Med. and Surg. Jour., 1922, clxxxvii., 349.
12. Pierce Williams: Proc. Roy. Soc. Med., May, 1924.
13. Broadbent: Brit. Med. Jour., 1925, i., 306.
14. Letheby Tidy: Ibid., 1925, i., 386.

JEJUNOSTOMY IN ACUTE GENERAL PERITONITIS.

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Two years ago I published a paper in THE LANCET on The Cause of Death in Intestinal Obstruction.[1] That communication was an attempt on my part to give a résumé and analysis of the great amount of work which had been done on the subject. In endeavouring to draw conclusions I stated that the weight of both experimental and clinical evidence pointed strongly to intestinal toxæmia as being the chief factor in causing death; that this toxin was

developed in the duodenum and to a lesser extent in the rest of the small intestine; and that, although it was not absorbed in the normal intestine, it was absorbed under the conditions which prevail in obstruction. In the same paper I also stated that I believed that death in acute septic peritonitis was not in most cases due to absorption of the products of the suppurative inflammation of the peritoneum but to intestinal toxæmia, secondary to paresis of the inflamed intestine, and, that if we could control this toxæmia there was a possibility of prolonging the patient's life for a sufficient time to allow the wonderful fighting properties of the peritoneum to deal with the infection. With this object in view I advocated the performance of a jejunostomy, by which means I believed that several apparently hopeless cases had been saved. Within the last two years I have employed this method in eight additional cases of peritonitis and I am fully satisfied that by its use some lives have been saved, and that in other cases convalescence has been rendered almost uneventful, although the conditions found at the operation were such as to lead one to expect a very anxious time.

Selection of Suitable Cases.

The class of case in which I would urge its use is the diffuse general suppurative peritonitis of the lower abdomen associated with appendicitis, tubal disease, and other septic conditions in the pelvis—the cases in which the intestines in the pelvis are acutely inflamed and the infection is already spreading upwards into the abdomen proper, so that, immediately on opening the abdomen, pus is seen lying between the congested coils of small intestine without limiting adhesions and, if a hand is passed down into the pelvis, a regular well of pus is found in the pouch of Douglas. In early cases the coils of intestine in the pelvis are at first dilated, but as the intensity of the inflammation increases they become collapsed and completely paralysed, while the coils higher up, where the inflammation is less acute, are dilated and paretic. When well established the condition is that so well described by Sampson Handley[2] as "ileus duplex"—a paralysis of the segment of pelvic colon and of the coils of small intestine which lie in the pelvis, with consequent dilatation of the proximal colon and upper ileum and jejunum. To deal with such a condition Sampson Handley advocates the performance of an ileo-colostomy to drain the upper small intestine, and a cæcostomy to drain the colon, but he naturally hesitates to adopt such an extensive procedure until satisfied that without it the patient's prospects of recovery are negligible. In other words, at the primary operation he merely deals with the cause of the infection and provides drainage of the peritoneal cavity, and then, if the peritonitis advances, he operates again a few days later and carries out the double drainage operation. I would like to advocate the performance of a jejunostomy in the first instance and I believe that then the necessity for the more extensive procedure would not arise—the jejunostomy will drain the upper intestine and the paresis of the pelvic colon can usually be controlled by enemata and pituitrin. I think Victor Bonney[3] was the first to recommend jejunostomy for these cases, but Sampson Handley, in a recent paper,[4] condemns its use, stating not only that it entails the loss by the patient of great quantities of fluid, but that a second operation for its closure is necessary should the patient survive. These objectionable results would certainly follow simple jejunostomy by the old methods of suture of the intestine to the parietal peritoneum, but both are obviated entirely if the operation is carried out as described in my previous paper as follows:—

"The operation I have performed is after the manner of a Witzel's gastrostomy—a No. 12 soft rubber catheter is inserted into the lumen of the intestine through a small puncture and fixed in position by a single catgut stitch, the next couple of inches of catheter are buried in the intestinal wall by a continuous in-folding stitch, and the proximal end is passed through a hole in the omentum, as described by Mayo,[5] before being brought out through the abdominal wall. To the end of the catheter a long tube is attached to drain into a bottle beside the bed."

At frequent intervals 6 to 10 oz. of bicarbonate of soda solution are run into the intestine, the end of the tube then being immediately depressed and replaced in the receptacle so that the toxic intestinal contents are diluted and their escape by siphonage encouraged. The outflow from this tube can be completely controlled and, as soon as it ceases to be the dark foul-smelling fluid characteristic of intestinal obstruction, the tube can be clamped in the intervals of being used as a means of introducing a soda and glucose solution. In a week or ten days the catgut stitch holding the catheter in situ is absorbed and the catheter is then removed—in no single instance in my experience has there been any subsequent escape of intestinal content, and thus no necessity for further operation.

Notes of Two Cases.

The following notes of two cases will serve to illustrate the types of cases in which I have employed the method, and will, I hope, demonstrate its utility. One case was almost desperate, whereas in the other I might describe the use of the method as prophylactic, as by it I believe the advance of the paretic distension of the gut was controlled, and the development of what may be termed a "vicious circle" obviated.

CASE 1.—A man, aged 60, was admitted to the Royal City of Dublin Hospital on Oct. 17th, 1924. He stated that he had been in failing health for some time; he had lost his appetite and suffered from marked constipation for some months; there had been no diarrhœa and he believed his motions had not contained blood or slime. Two weeks before admission he complained of a "soreness" in the left lower abdomen; this had gradually increased, culminating in an acute attack of pain three days previously. Since the onset of the acute pain he had vomited at frequent intervals, and could not retain even water taken by mouth; the vomit was dark and foul-smelling; his bowels had not moved for four days. Examination revealed a very grave state of affairs. His aspect was very bad, blue and pinched, and his general condition such that the clinical clerk described it in his notes as "collapsed, in extremis." The tongue was dry; temperature 98·8° F., pulse 110, but so weak and irregular that no reliance could be placed on the count. The abdomen was distended, distension being chiefly marked in the hypogastric region, while respiratory movement was confined to the upper abdomen; on palpation there was but slight tenderness and no rigidity in the upper abdomen, but both were marked below the umbilicus, and especially in the left iliac fossa; the presence of free fluid was easily demonstrated in the flanks. Rectal examination revealed the presence of marked tenderness and the characteristic "doughy" feel, associated with pelvic peritonitis; the rectum was empty. It was decided to operate as a forlorn hope. The abdomen was opened by a right paracentral incision below the umbilicus three-quarters of an hour after his admission. Immediately the peritoneum was incised foul-smelling pus escaped; everywhere in the lower abdomen the coils of intestine were acutely inflamed, dilated, and bathed in pus; there were no limiting adhesions. A hand was passed into the pelvis and a large quantity of very foul-smelling pus welled up; the appendix was examined and was obviously not the source of the infection, but on exploring the left iliac fossa a hard, irregular mass fixed to the brim of the pelvis was felt in the pelvic colon—a carcinoma or a diverticulitis which had perforated. A large tube was placed in the pelvis, both flanks were drained through stab wounds, and a left inguinal colostomy performed through a separate incision. A jejunostomy as above described was done into a dilated loop of the small intestine as high up as possible, and the patient returned to bed more dead than alive. His condition during the next three days was such that his death was hourly expected; his extremities were cold and clammy and the pulse at times imperceptible. The jejunostomy acted well; he received 8 oz. of soda bicarb. solution through it every two hours, and a great quantity of dark fluid drained away; vomiting ceased on the day following operation and fluids were give freely by the mouth from that time onwards. Hiccough persisted for several days after the vomiting had ceased. Fæces began to come from the colotomy opening on the third day. On the fourth the fluid from the jejunostomy tube became clear and, at the same time, his general con-

dition showed a marked change for the better. The administration of the soda and glucose solution by the tube was continued for three more days and, in the intervals, the tube was clamped. His condition from the fourth day on gradually improved; the discharge from the drainage openings decreased and finally ceased. The jejunostomy tube was removed on the eighth day and no leakage of intestinal contents took place. Finally he was discharged on the thirty-first day in quite fair condition.

I have performed jejunostomy on two other almost identical cases of septic peritonitis, due to infection from tumours of the pelvic colon. One died and the other made a good recovery, although for the first two days following operation he was almost pulseless, intensely toxic, and apparently moribund.

CASE 2.—A boy, aged 16, was sent to the Royal City of Dublin Hospital on the evening of Jan. 6th, 1925, by Dr. P. Gavin of Moynalty. He stated that on the night of the 3rd he was seized with sudden severe pain in the right lower abdomen and vomited a great deal; the pain continued for two days but had eased off somewhat during the 24 hours preceding admission, being to some extent replaced by a "soreness" across the whole lower abdomen; he had vomited three or four times each day, and the bowels had not moved since the morning of the 3rd; there was some pain on micturition. On examination his aspect was moderately good, face flushed and anxious but not pinched; the tongue was furred and moist, temperature 102° F., pulse 112. The respirations were almost entirely thoracic; the lower abdomen was distended, the upper limit of distension being quite sharply marked at the level of the umbilicus; he was tender all across the hypogastrium, especially so in the right iliac fossa. Rectal examination confirmed the diagnosis of pelvic peritonitis and an operation was performed immediately through a right paracentral incision and revealed a diffuse purulent peritonitis of the lower abdomen. The coils of intestine in the pelvis were intensely congested and dilated, and lay in a bath of pus. The intensity of the congestion and the quantity of purulent exudate gradually diminished as the abdominal cavity proper was reached, so that the coils immediately underlying the umbilicus were dilated but not congested. A perforated pelvic appendix, gangrenous in its middle third, was removed; a large tube was placed in the pelvis and a jejunostomy performed into one of the dilated loops of the small gut, lying just above the level of the umbilicus. Instructions were given to place the patient in the Fowler position and to run six ounces of soda solution through the jejunostomy every four hours, the tube in the interval to be left unclamped and draining into a bottle beside the bed. Rectal salines were also ordered. The conditions found at operation in this case were such that I gave a very guarded prognosis and anticipated a very stormy convalescence, so I was more than pleased next morning to find the lad looking well and to hear that he had not vomited since the operation. The tube was working well, a good quantity of dark fluid escaping; his temperature had fallen to 99° and pulse to 100. It is unnecessary to give details of the convalescence; suffice it to say that he steadily improved from day to day, the outflow from the tube becoming clear in 24 hours and the tube itself coming away on the seventh day, no fistula resulting. He finally made an excellent recovery although his discharge from hospital was delayed until the fortieth day owing to the development of a small secondary abscess in the right iliac fossa, which discharged through the scar of the original drainage opening.

Three other cases of diffuse peritonitis originating in the pelvis and extending into the abdomen proper were similarly treated and made good recoveries. In two the cause of infection was a gangrenous appendix, and in the other a rupture of a pyosalpinx. I have also employed jejunostomy in the following cases. (1) Pelvic peritonitis due to a gunshot wound traversing the pelvis and puncturing the rectum in two places. This man made a rapid recovery, the peritonitis not extending. (2) Acute intestinal obstruction by a band. This man was intensely toxic and great quantities of dark foul-smelling fluid drained from the tube for four days. After that time recovery was uneventful. (3) Acute pneumococcal peritonitis. This patient died from a general pneumococcic septicæmia.

References.

1. THE LANCET, 1923, ii., 62.
2. Brit. Jour. Surg., October, 1915, p. 161.
3. Arch. Middlesex Hosp., 1910, xxi., 39.
4. Brit. Jour. Surg., 1925, xii., 417.
5. Annals of Surgery, 1917, lxvi., 568.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ELECTRO-THERAPEUTICS.

A MEETING of this Section was held on April 17th, Dr. STANLEY MELVILLE, the President, being in the chair.

The Organisation of a Light Department for Surgical Tuberculosis.

Sir HENRY GAUVAIN read a paper on the organisation and work of a light department in a surgical tuberculosis hospital. He said that though he had used heliotherapy for some years, it was only since the war that a light department had been established in the hospital of which he had charge at Alton, and that was owing to the munificence of Sir William Treloar. He explained that he meant by "light treatment," treatment by light produced artificially as opposed to sunlight; he objected to the term "artificial sunlight." Theories which had been advanced as to the biological action of light were contradictory, sometimes confusing. He was convinced as to the value of light in surgical tuberculosis, but this form of treatment was very expensive, as large amounts of current were consumed, the services of skilled electricians must be secured, experimental work must be done, numerous accessories purchased, and a staff of nurses specially trained must be maintained. An equipment for giving light treatment was urgently needed, especially for cases of lupus. At Alton there was already an admirable generating plant, and the resident engineer skilfully adapted the new plant without extra expense. Finality in this matter had not yet been reached, and he believed much that was important would be discovered in the near future, therefore room should be left for possible modifications. Accordingly the ward for this work was a wooden structure, placed quite near to the power-house, to save cost of cable, and risk of fire was reduced by covering floor and walls 4 feet high with asbestos. There were two cables, one to convey a current of 70 volts, the other one of 110 volts. He took as his model the Finsen Institute in Copenhagen, which he visited twice and for which he had unstinted praise. There the lamp used for general light baths and local treatment was the carbon arc lamp. Lupus remained the most common form of tuberculosis treated. A highly-educated woman came from the Copenhagen institution to Alton to instruct the nurses there, and remained six months. At Alton eight ambulant cases could be treated simultaneously by means of the 75-ampère carbon arc lamps, and there were two water-cooled carbon arc lamps for local treatment.

The Use of Ultra-Violet Rays.

Sir Henry Gauvain said he also made provision for testing and employing any other form of radiation which seemed to promise success, and much attention had been given to the subject of ultra-violet radiation. The value of this, especially in rickets, had been amply demonstrated; and it raised the bactericidal power of the blood. The tendency nowadays was to use, in increasing degree, the short rays of the spectrum, but many "artificial sun" lamps were rich in rays not to be found in the solar spectrum. He had used mercury-vapour, tungsten arc, iron arc, and other lamps, also numerous electrodes, and they were serviceable for certain local conditions, but in a general way for surgical tuberculosis they had not come up to his expectations. He preferred the Finsen lamps. Clinical experience still remained the most reliable guide. The tendency to employ short wave radiation indiscriminately was not without danger. In acute neuritis of undiscovered cause, however, these rays quickly produced a very striking relief.

On the physical side it was possible to produce an almost infinite variety of radiant energy, but there was still so much to learn concerning its

biological effect that there was need of skilled laboratory workers in connexion with light departments. In such a department there must be complete and responsible supervision during the treatment; all the work was visible to the charge nurse, and there were no cubicles, though privacy was secured when certain areas of the body were being treated. At the conclusion of treatment the whole department was cleaned out, and all lamps, lenses, and compressors received careful attention. At the present time 28 patients were having arc treatment each day, and 56 persons had light baths every alternate day. Goggles were worn, each patient having his or her own. Water was drunk during the treatment. The exposure was half an hour for new patients, and was increased to a maximum of two and a half hours. It induced free perspiration, and at the conclusion the ambulant cases had a shower-bath and rub down. The patient's head was protected from the heat by asbestos masks. For local treatment the part concerned was first exsanguinated by means of compressors, and no further treatment of the area was carried out until the local reaction had subsided. Most of the patients had graduated seaside baths at Hayling Island, and the beneficial effect of this was very marked.

For surgical tuberculosis Sir Henry Gauvain regarded the light treatment as an accessory, the success depending on the skill with which it was blended with the other means. For this form of tuberculosis the air-cooled mercury-vapour and tungsten arc lamps were not so valuable as the carbon arc lamps, and their value diminished after a few applications. They had been found to be good for sinuses, suppurating and discharging glands, scrofuloderma, &c. The water-cooled iron arc lamp was good for local lesions, and it had the merit of being cheap. Infra-red radiations were of limited value, but in patients whose blood possessed high bactericidal power they hastened cure. Sir Henry Gauvain said he was now engaged in perfecting a lamp designed for giving light treatment to patients who could not be brought to the hospital. Some of the requirements were that the lamp should be readily portable, simple in application, and adaptable to the ordinary wall-plug for electrical supply. He said he felt grave misgivings as to the use of a powerful source of ultra-violet light in the hands of the inexperienced. Certain disease conditions derived greater benefit from one form than from others, and some only received the maximum help from both forms of radiation, supplemented by physical aids to cure. Work was now being done at Alton which, without the aid that the newly-installed department gave, could not have been done at all. He had frequently cut out portions of tissue which had been irradiated and shown that the tubercle bacilli in them were dead.

Selection of Apparatus for Producing Artificial Sunlight.

Dr. G. MURRAY LEVICK said the time had not yet arrived for laying down hard-and-fast rules on this subject, as experience was brief. "Artificial sunlight" should be understood to mean the application to the body of rays such as were found in sunlight, but not necessarily in the proportions occurring in nature. By using the mercury-vapour lamp with the long-ray lamp he had obtained better results over a large range of cases than by the use of the open arc lamp. He had successfully used the latter with carbons which were impregnated with nickel, especially for cases of general debility without apparent cause, neurasthenia, and chronic rheumatism. But the open arc lamp with carbon terminals did not give such good results in the case of rickety and tuberculous children as did the mercury-vapour combination, and the latter permitted of accurate dosage, an important matter, as elderly subjects with rheumatoid conditions showed an extreme sensitiveness to light, and experienced a reaction, as evidenced by aching pains, headache, and a slight rise of temperature. Recently there had been placed on the market self-exhausting tubes, and it was not yet known how long they would last. A 2000-candle power mercury tube sufficed for all general purposes. The chief faults were inaccessibility of the reflector and the difficulty of accurate focusing; he was designing an apparatus in which these would be overcome.

He had found that the red rays were of great value in promoting nutrition and the power of local repair, probably through local stimulation of the sympathetic nerves. These rays penetrated very deeply, and quickly promoted growth of muscles. Heat rays were interrupted by water. A disadvantage of the mercury-vapour lamp for general use was that, on account of the intensity of the radiation, it required skilful handling. It was most important that the patient should be stationary during the application, so as to preserve a uniform focus. He pleaded for exactitude in the administration of radiation. He agreed that the arrangement, organisation, and working of the Copenhagen institution were masterly.

Dr. P. R. PEACOCK referred to the work which had been done by Prof. Russ and himself on the physics of ultra-violet irradiation. He said that pigmentation frequently resulted from exposure of the skin to the rays. It was agreed that there were unaccountable variations in the response of different people when exposed to the same kind of treatment, some pigmenting, others merely freckling. Clear skins fluoresced better than did dark ones. Certain parts of the body were fluorescent; sweat and blood were non-fluorescent. Sebum was the most brilliantly fluorescent, and melanin absorbed the whole visible spectrum. From the ultra-violet point of view, fluorescence seemed to be a protective phenomenon. Skin which had been treated with vaseline withstood three and a half times the radiation of normal skin before showing reaction. Pigmentation occurred only as a result of considerable exposure, and it might be taken as an indication that fluorescence had failed to protect the tissue. Hence if application of the treatment could be made without producing pigmentation the effect might be much better, as pigmentation protected the skin against the action of the very rays which it was sought to influence it by.

MANCHESTER MEDICAL SOCIETY.

A MEETING of this Society was held on April 1st, Prof. G. R. MURRAY, the President, being in the chair.

Dr. D. E. CORE opened a discussion on

ENCEPHALITIS LETHARGICA.

He began by describing a typical case of average severity in a man of 24, and then dealt with certain symptoms in detail. As regards the diagnosis of encephalitis lethargica, he said it was important to remember that often enough the condition escaped recognition as an illness by the patient and his friends; it might only be revealed as such in the light of the after-course. The idea of establishing a diagnostic scheme based upon symptoms was in his mind untenable, and the present-day tendency to do so was responsible for the number of erroneous diagnoses. Apart, however, from objective signs of implication of the nervous system, he had been increasingly impressed by the interesting relationship between the symptoms and the patient's consciousness. In normal life there was a reasonably close parallelism between objective behaviour and the personality of the individual; a man who acted in an uncontrolled way usually showed signs of mental uncontrol; one who seemed to be profoundly unconscious was as a rule unconscious; and a delirious patient was not in general aware of his surroundings. In encephalitis lethargica, however, this association did not appear to obtain. The most restless and uncontrolled patient was quite commonly capable of giving a remarkably clear and logical account of his sensations without any evidence of psychical uncontrol; it was notorious that the patient somnolent to the point of coma was not only often, but was usually able to answer questions and give information demanding considerable concentration; and the same phenomena

were to be observed in the delirious patients. Furthermore, the ability to memorise subsequently events occurring in their environment at such times was considerable. In other words, instead of the normal association between the psychical state and the somatic symptoms, there was a dissociation; a dissociation which was anatomical rather than psychical and which, in his mind, was the most characteristic feature of the disease under discussion. The same principle was at work in the frank emotional uncontrol that was liable to affect children as an after-state and the somatic uncontrol in the young adult with symptomatic paralysis agitans. From the standpoint of diagnosis this dissociation was, in his opinion, of greater value than objective signs of cerebro-spinal implications.

Dr. W. ST. CLAIR MCCLURE said that encephalitis lethargica was an infectious disease spread by "carriers." The organism responsible was universally distributed, but happily the majority of people were immune to its attack. All ages were liable to attack, but the incidence fell specially heavily between the ages of 10 and 20 years. Males and females were about equally attacked, and there was no special preponderance of cases in any one particular occupation. Bad environment appeared to predispose to an attack. In a series of 224 cases in 1924, 20 per cent. died, and after 12 months 20 per cent. had apparently recovered and 60 per cent. had residua of some kind, two-thirds of which were of a Parkinsonian character. Similar figures for 50 cases which occurred in Manchester in 1920–21 were: Mortality-rate 56 per cent., recovery-rate (three years after onset) 14 per cent., and incapacity-rate 30 per cent. Taking into consideration wrong diagnoses and non-recognised cases, 15 to 20 per cent. probably represented the recovery-rate, though it differed in different epidemics. The prognosis in any individual case was guess-work, but it was a hopeful thing to know that complete recovery was possible in cases which at first appeared hopeless, and it was to be noted that all who did not recover were not totally incapacitated. In many the disease process came to a standstill and a useful and more or less happy existence was possible.

Hiccup.

Hiccup might occur as one of the symptoms of encephalitis lethargica, and one must suppose that it might be the one and only sign of the disease. Epidemics of hiccup and encephalitis, however, did not as a rule run concurrently. In Manchester, in 1924, a hiccup epidemic preceded the encephalitis epidemic. In December, 1923, and January, 1924 there was a generalised epidemic of hiccup in the city. The attacks consisted of persistent hiccup lasting three to ten days, unaccompanied in the majority of cases by other symptoms. Some few exhibited drowsiness. The sufferers invariably recovered without sequelæ, and inquiry 12 months after had not so far resulted in the discovery of any post-encephalitis signs amongst them. In the investigation of cases of encephalitis lethargica special inquiry was made amongst 1200 contacts for a history of hiccup. Only two were discovered. The households attacked by encephalitis lethargica were not those attacked by hiccup. Amongst the encephalitis lethargica patients hiccup was one of the symptoms in about 3 per cent. There was therefore no evidence favouring the view that the two diseases were associated, though such a possibility was not excluded. Influenzal cases had not given rise to encephalitis lethargica, nor had cases of the latter disease given rise to influenza. A study of the epidemic waves of influenza and encephalitis in Manchester showed that there was no correlation in point of time between the two diseases and provided no evidence in support of the contention that they were associated in any way one with the other.

Pathological Aspects.

Prof. J. H. DIBLE said that, speaking as one who saw the disease from the pathological side, he was in full agrement with the previous speakers as to the difficulties in clinical diagnosis. The first three cases in which he was called upon to do post-mortems turned out to be tuberculous meningitis. He wished to draw the attention of the Society to the experimental pathology of the disease. At the onset of its epidemic phase, analogy with poliomyelitis suggested that it might be transmissible to apes and investigated upon the lines so successfully followed by Flexner and his associated workers in the latter disease. Early experiments, however, particularly of McIntosh and Turnbull in this country, failed to infect these animals, and it was not until 1919 that Strauss, Hirschfeld, and Loewe reported successes from America. These workers then reported further successes with nasopharyngeal washings and cerebro-spinal fluid, as well as brain material, as the source of the infecting agent, and they claimed that the rabbit and not the monkey was the animal of choice for this work. Early in 1920 Levaditi and Harrier claimed to have transmitted the disease to rabbits, and about the same time McIntosh published an account of similar successful inoculation of monkeys in series, and from monkey to rabbit. The speaker himself had since 1920 been attempting to convey the disease to the lower animals, and gave details of many attempts, using material derived from ten cases of the disease, to transmit the infection to rabbits. These invariably failed whatever type of material was used as inoculum and by whatever route the inoculation was made. Attention was drawn to the existence of two schools, the one claiming that production of the disease in animals was readily enough accomplished to be used as a diagnostic measure with the cerebro-spinal fluid, whilst the other school, of whom Levaditi was the protagonist, claimed that the disease was definitely inoculable but only with difficulty, and that success was rare. Prof. Dible's own experiences had been entirely negative. Recently Flexner, whose authority in this type of work was very great, had published the results of a very large series of attempts which he had made in conjunction with Amos. All material from cases of encephalitis had failed to infect: a positive result was obtained in one instance, but this was with cerebro-spinal fluid from a case of cerebral syphilis and not one of encephalitis at all. Such results called into question again the validity of all published positive results. The matter was one of great difficulty, and complicated in many ways, one of the most confusing questions being the relationship of the encephalitis produced in animals by certain workers to that which the herpetic virus of Grütner was capable of setting up. Much more work was required before the matter could be regarded as settled, but in the opinion of the speaker the claim to have transmitted the disease to animals was as yet unsubstantiated.

Dr. C. J. C. EARL spoke of the cases under his care in Monsall Hospital. He agreed with the previous speakers as to the difficulty of diagnosis. Out of 16 cases admitted as encephalitis lethargica 11 were proved to be other conditions, including tuberculous meningitis, brain abscess, and brain tumour. Some of these cases were impossible to diagnose on physical examination alone. He had seen the typical dissociation of which Dr. Core had spoken, in a case of a cerebral abscess situated in the region of the basal ganglia. One case was admitted certified as mumps which proved to be encephalitis with parotitis. In three out of five of the more acute cases admitted herpes labialis was present. In one of these cases the sister of the ward also developed herpes labialis though without any nervous signs. He would be interested to know whether she should be regarded as suffering from the disease in a latent form or, on the other hand, as immune to it. One of the acute cases had shown excitability to a marked degree. He mentioned one case of inversion of sleep rhythm. This case—a child—was more intelligent and cunning during the night than in the day time. He also wrote a much clearer hand at night.

Reviews and Notices of Books.

CHRONIC EPIDEMIC ENCEPHALITIS.

By AUGUST WIMMER, M.D. With Preface by Sir F. W. MOTT, K.B.E., M.D., F.R.C.P. Lond., F.R.S. London: William Heinemann (Medical Books), Ltd. 1924. Pp. 335. 21*s*.

P. M. Latham, in his lectures on subjects connected with clinical medicine, wrote: "In chronic disease we see only what it has done, not what it is doing; in acute disease we see both." Acute epidemic encephalitis is showing us what it has done in its chronic manifestations. It is now apparent that the acute symptoms of the disease may (1) subside altogether, (2) merge into a chronic form, or (3) chronic symptoms may supervene after a period of remission. It should be added that in a large proportion of cases the acute attack of encephalitis passes unrecognised or is concealed under the term of "influenza" or "febricula." Transient diplopia is frequently associated with the acute stage.

Dr. Wimmer, who is professor of psychiatry in Copenhagen University, was, he tells us, initiated into English neuropathology by Horsley and Beevor. He has produced an admirable book on the chronic manifestations of epidemic encephalitis, with examples of clinical cases that have been under his observation. The work on this subject, owing to the comparatively recent recognition of epidemic encephalitis, is of necessity incomplete; it is no disparagement to state that in its present form his book must be regarded as an interim report upon the chronicity of epidemic encephalitis. The pathology of the chronic disease is not fully worked out; the few inoculation experiments made on rabbits are noted with proper diffidence, and as regards course and prognosis of the malady, the author states that no reliable forecast can be given in the concrete case, the prognosis being mostly guess-work. Until the lapse of time has allowed these matters to be adequately valued, the neurologist will find Prof. Wimmer's work a useful guide and aid in checking his own studies of clinical cases.

Prof. Wimmer considers the chronic forms of epidemic encephalitis under several heads. The account of psychotic disturbances agrees closely with the British and French descriptions. Stress is laid upon the changes in moral character and conduct displayed by children, upon the nocturnal type of disturbance, and upon the well-recognised fact that it is rare to find such coarse moral deterioration in adults as in youths and children. Disorders of sleep in both children and adults, including the troublesome insomnia, are described. Under the classification of vegetative symptoms, such phenomena as salivation, general or localised perspiration, vasomotor disturbances, obesity, and emaciation are noted. The author draws attention to the oscillations in temperature that are seen occasionally in the chronic forms of disease; he advises that the morning and evening temperatures should be taken daily. The main features of chronic encephalitic Parkinsonism, "paralysis agitans sine agitatione," are given. Prof. Wimmer is unable to dismiss the supposition advanced by Souques, Netter, and others that the "classic" paralysis agitans may be, often or perhaps usually is, of an encephalitic origin. It would be interesting to learn whether symptomatic paralysis agitans is of such frequent occurrence in Denmark as Souques, Naville, Bing and Staehelin, and others find it to be on the Continent.

A large section of the book is devoted to intermediary types. Under this heading Prof. Wimmer has grouped a number of clinical manifestations. It is interesting to note, having regard to the frequency of involvement of the ocular nerves in the 1918 epidemic, that the author finds while in some few cases the eye symptoms of the initial stage may persist during the further course of the encephalitis, they will, as a rule, disappear. Involvement of the optic nerve was detected in seven cases, which is exceptional. Some patients relapsed into lethargy. Several cases presenting epileptic seizures are described; it is possible that some, if not all, of these were examples of true idiopathic epilepsy; indeed, after reading this part of the book we are left with an uneasy impression that Prof. Wimmer in his search for intermediary types has thrown his net a little too wide. Extra-pyramidal hyperkinesia, under which term the author includes tremors, myoclonus, choreiform movements, and athetoid (torsion) movements, completes the classification of chronic epidemic encephalitis. There are interesting chapters on diagnosis, pathogenesis, and pathophysiological mechanisms. The author inclines to the view that the chronic manifestations of epidemic encephalitis are due to persistence of the causal virus in the human organism.

Prof. Wimmer writes in excellent English and his book is well illustrated by photographs and photomicrographs.

DISEASES OF THE NOSE, THROAT, AND EAR.

Fifth edition. By E. B. GLEASON, M.D., LL.D., Professor of Otology, Medico-Chirurgical Graduate School, University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. 1924. Pp. 660. 20*s*.

THIS text-book, which is of the type intended for students and general practitioners, is full of valuable instruction and gives evidence of the author's wide practical experience. The appendix on formulæ contains an unusual feature, a full description of the action and method of use of the more important drugs, which will be found very useful. The section on diseases of the ear is particularly thorough and good. In some places the work suffers from a lack of orderly arrangement; for instance, otosclerosis is so mixed up with middle-ear catarrh that a clear picture of the disease and its treatment is unobtainable. More space could be gained by the omission of some operations which are now little used; for instance, a full account is given of the operation of severing the incudo-stapedial articulation, and mobilising or extracting the stapes, of which the author says that he performed it a number of times some years ago. The description of paralyses of the larynx fails to give a clear idea of their ætiology, so valuable in the diagnosis of various diseases, and does not note the fundamental distinction between the functional adductor paralyses and those resulting from organic lesions of the nerve-tract. Indeed, adductor paralysis of one vocal cord is described, with no hint that it is uncommon; and of Semon's law it is only said that "in all progressive lesions of the centres or trunks of motor laryngeal nerves the abductors are more frequently affected than the adductors," surely a very insufficient statement of the case. The illustrations, on the whole, are not worthy of the text.

COLLECTED PAPERS.

Published Papers by Members of the Staff of the Middlesex Hospital Medical School, 1923–24. Collected Papers of the Department of Physiology, University College, London. Vol. XXII. 1924.

THE collection and publication of papers by groups of workers in the same institution is undoubtedly a valuable method of recording research work, but the reproduction of the essays is attended with one drawback, only to be avoided by expense that would not be warranted. In both of these volumes reprints of widely different sizes have been bound together, with curious heterogeneous results; some of the reprints have required awkward cutting or folding; the association of coloured covers of individual papers, often of contrasting and violent hue, does not please the eye, and indexing has proved impossible.

The material in both these heterogeneous volumes is really valuable, records from the Middlesex Hospital of important work on the effects of radium and X rays on cancer being especially noticeable. The measurement of radiations on the one hand and their effects on general metabolism on the other form the subject of several communications. Biochemical investigations on the toxæmias of pregnancy, certain aspects of the preparation of insulin, and interesting work carried out on dental caries, with particular reference to the *Bacillus acidophilus odontolyticus*, are other examples of recent work emanating from this hospital.

Of the collected papers of the physiological department of University College an assortment of reports of researches on questions of muscular activity forms a large part, and includes the Nobel lecture of 1923 by Prof. A. V. Hill. The other main interest lies in the work on vitamins, especially the fat-soluble factor; investigations into the properties of cod-liver oil and into the production of rickets in certain animals such as cows and pigs form an important part of the work carried out during the past year. The scientific value of the papers published in both these volumes need not be emphasised, for it is unquestioned. Several of them we were privileged to publish in our columns, and on others we have had occasion to comment on their appearance in special journals. Their value as permanent records of the achievements over a given period of the staff of an institution would be so much enhanced by better format that it is impossible not to regret their appearance.

The orderly volumes issued by certain institutions across the Atlantic form a striking contrast to these publications; they are doubtless far more costly.

PÆDIATRICS.

The Practice of Pediatrics. Third edition. By C. G. KERLEY and G. W. GRAVES. London and Philadelphia: W. B. Saunders Company. 1924. Pp. 922. 45*s.*

THIS volume is the outcome of a thorough revision of Prof. Kerley's well-known text-book by the author in collaboration with Dr. G. W. Graves. The amount of new material which it contains is large in proportion to the very moderate increase in size, owing to the elimination of a number of the older articles. The new edition presents a comprehensive survey of the subject, and includes the infectious fevers and also many of the ailments of childhood which are commonly classed as surgical.

The chapters concerned with the infant have been revised and enlarged; they contain a wealth of sound advice as to general management, but the methods of milk modification which are recommended have the drawback of being somewhat complicated, and on the whole more suitable for an institution than for the practitioner. Night feeding is advocated during the first three months, and the addition of cereals from the fifth month. The statement "that starch may be digested by the youngest and most marasmic infant has been proved" may be strictly correct and yet be a source of danger if adopted too freely as a principle in infant feeding.

Considerable addition has been made to the section on gastro-intestinal ailments, which now occupies a large proportion of the book. The authors attach great importance to developmental abnormalities of the alimentary tract in the production of malnutrition and disease, and illustrate their description of them by a series of excellent radiograms. The principles of dietetics in the years following infancy are presented clearly; excessive consumption of milk is regarded as the most frequent source of digestive troubles during these years. Fewer changes have been made in the chapters on respiratory diseases, but the section on asthma has been re-written, and includes an account of protein sensitisation. The authors have not modified their view of the treatment of empyema, and adhere to the opinion that aspiration is never to be looked upon as a substitute for incision. Among other additions will be found a description of encephalitis lethargica; the sequelæ hardly receive due recognition of their importance to pædiatrics, being summarised in a few lines without any reference to disturbances of sleep. An article entitled the Suboxidation Syndrome contains an interesting review of a group of symptoms corresponding fairly closely to those which are associated with the term vagotonia.

The appearance of the new edition brings this work fully up to date; it is clearly written and well indexed, and is likely to increase the popularity of the former editions.

Safeguarding Children's Nerves. By J. J. WALSH, M.D., Professor of Physiological Psychology, Cathedral College, New York; and J. A. FOOTE, M.D., Professor of Diseases of Children, Georgetown University Medical School. London: J. B. Lippincott Company. Pp. 272. $2.00 (9*s.*).

THE authors of this book have attempted to provide parents and others who are interested in child welfare with a manual of child management directed particularly to the production of a stable nervous system. In a large measure they have succeeded; the book is easily intelligible and free from fads, and contains much sound advice presented in a homely and convincing style. Fresh air, exercise, and facilities for spontaneous play are stressed throughout the work as the fundamental requirements of a healthy environment; the failure to provide them, and their replacement by unsuitable occupations—the "menace of the movies" in particular—are regarded as the most frequent causes of nervous instability in the child. The authors' attitude towards discipline is balanced and reasonable; while opposed to unnecessary restrictions and "don'ts" they deprecate the present tendency to dispense with penalties, and consider that corporal punishment calmly administered is frequently preferable to any of its substitutes.

The parts of the book which deal with the attainment of a healthy environment are sound and helpful, but on the more controversial ground of causation the authors may be accused of overstating their case. The chapter entitled the Bogey of Heredity does not add to the value of the book, and is likely to mislead many of its readers. The careful research of Dugdale and Goddard into family histories is referred to with scant respect, and the impression is given that their conclusions are discredited. Arguments based on Mendelian laws are brought forward which may be applicable to the transmission of mental defect, but it is not made clear that there is no evidence of their application to the transmission of neurotic tendencies, with which the work is principally concerned. The chapter on defective children is admirable, and contains most valuable advice, which is too seldom given to parents, on the serious effects of retaining these children in the home.

Essentials of Infant Feeding. By E. A. BARTON, Medical Officer to the Child Welfare Department, University College Hospital. London: H. K. Lewis and Co. 1925. Pp. 80. 3*s.* 6*d.*

THE object of this little book is to initiate the student into the technique of an infant clinic. The material is highly condensed, and is rightly presented in a somewhat dogmatic form. It falls into three divisions, dealing with breast-feeding, milk, and artificial feeding. Dr. Barton is to be congratulated on having achieved not only lucidity, but simplicity, in the last two sections of the book, and the student will be able to obtain from it a clear idea of the rationale of infant feeding, without being bewildered by the elaborate formulæ by which this subject is so often complicated. The extent to which he should put his trust in calories is discussed in an easily

intelligible manner, as are many of the other problems in which theory and practice require some mutual adjustment. This book should fulfil admirably the purpose for which it was written.

ULTRA-VIOLET RAYS IN THE TREATMENT AND CURE OF DISEASE.

Second edition. By PERCY HALL, M.R.C.S. Eng., L.R.C.P. Lond. With introductions by Sir HENRY GAUVAIN, M.A., M.D., M.C. Camb., and LEONARD E. HILL, M.B. Lond., F.R.S. London: William Heinemann (Medical Books), Ltd. 1925. Pp. 114. 7s. 6d.

WE have ample proof that artificial light rays supply us with an admirable weapon in so far as the fight against surgical tuberculosis, lupus, and rickets is concerned. Many lamps have been placed on the market, some of which do and some of which do not give off ultra-violet rays. Unfortunately, many inaccurate and misleading impressions seem to have become settled in the lay mind. Among others, that treatment by such lamps is a simple and harmless proceeding, whereas it requires the supervision and guidance of an expert. It is to remove these false impressions that this book has been published, and the author's testimony is supported by introductions from Sir Henry Gauvain and Dr. Leonard Hill, who have done so much of the pioneer work on this subject in this country.

Dr. Hall has had much practical knowledge of the uses of lamps for artificial light treatment and gives a general survey of his results in treatment of various diseases. His book has been so well received that a second edition has appeared seven months after the first. The results obtained by Dr. Hall in treatment of such various maladies as rheumatoid arthritis, gout, osteo-arthritis, lumbago, sciatica, neurasthenia, pulmonary tuberculosis, chronic dyspepsia, and high blood pressure are very interesting. He is careful to point out that he uses artificial light rays merely as an adjuvant. In fact, he would appear to make as much use of diathermy as he does of ultra-violet rays. No doubt, although he does not say so, he has used rest, diet, change of scene, and other valuable factors in treatment.

We all know that those who can afford it pay yearly visits to sunny climes for the alleviation of such diseases as Dr. Hall enumerates. This, in itself, is some confirmation of the claims that he puts forward. Those remaining at home are robbed of much of the sunlight there might be in fine weather in winter by the smoke nuisance and the prevalence of fog. It will be a boon if artificial light rays, properly and skilfully controlled, prove to be a substitute for the sun during the winter darkness.

TEXT-BOOK OF OPHTHALMOLOGY.

Eighth edition, revised. By Hofrat ERNST FUCHS, former Professor of Ophthalmology in the University of Vienna. Authorised translation from the twelfth German edition, with numerous additions by ALEXANDER DUANE, M.D., Surgeon Emeritus, Knapp Memorial Hospital, New York. London: J. B. Lippincott Company. 1925. With 455 illustrations. Pp. 997. 42s.

THIS is practically the same book as the seventh edition, published in 1923. So slight indeed are the alterations that the paging is unaltered, and the index to the seventh edition serves equally well for the eighth. There are a few additions of small importance and some new illustrations, while some of the old ones have been redrawn. Thus the diagram of the nerves and centres constituting the motor apparatus of the eye is elaborated so as to include the cortical motor centres and the labyrinth of the ear. In the section dealing with operations an improved method of blepharoplasty for the lower lid is described, but unfortunately, owing to a misprint, the description is wanting in lucidity. Perhaps the most notable addition is the recognition of recession as an essential part of the operation of tenotomy of an internal rectus. Without this or some equivalent procedure the operation is only too likely to cause a divergence, if not as an immediate result, at some later period.

The continual demand for this book, one of the best known of the larger ophthalmological text-books, is a proof of its popularity on both sides of the Atlantic.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE, January, 1925.—In this issue the Relation of Organic Dust to Pneumonoconiosis is discussed by H. R. M. Landis. The author points out that a mistake is made when the well-known damage caused by inhaling inorganic dusts, notably silica, is extended to organic dusts. No evidence exists to condemn organic dusts. He obtained autopsy protocols on 50 persons who had never followed any other occupation than that of textile workers; in no case were there changes in the lungs comparable to those noted from exposure to inorganic dust. The findings and also the causes of death differed definitely from those seen, for instance, in the pottery industries. He concludes that organic dust has no power to establish the condition known as pneumonoconiosis. At the same time he allows that some organic dust gives rise to protein intoxication, such as asthma and threshers' fever.—An article of unusual interest is contributed from Moscow by I. Guelman on Industrial Poisoning by Arseniuretted Hydrogen. It is based on the occurrence of 12 cases treated at the Moscow Institute for Investigation of Occupational Diseases. Detailed observations are given, and the author shows reasons for holding that poisoning by arsine acts primarily and mainly by destroying and damaging red corpuscles; by liberating hæmoglobin and so causing hæmoglobinæmia; and from a consequent myelogenous reaction. The symptoms observed are due to these alterations in the blood interfering with the normal function of various organs. Thus jaundice and hæmoglobinuria follow from the hæmoglobinæmia, while the function of the liver is overstrained by the same condition. "The course of the disease is a convulsive struggle of the system to free itself of this ballast." Arsine passes through the alveoli of the lungs without damaging the cells; nor is there evidence that other cells except the erythrocytes are in any way damaged. When once the blood condition is remedied, the different organs recover entirely. The article is not only of interest in itself, but is an indication of the good work which is being done at industrial clinics in Russia.—J. A. Myers deals with the vital capacity of the lungs and its practical application. He presents a useful and well-written summary of work done by other observers on this subject, and also gives a valuable bibliography. February, 1925: The anatomical distribution of occupational cancers is dealt with by E. L. Kennaway, who gives valuable information as to the occurrence of cancer of the skin due to coal-tar products in various occupations, such as those of chimney-sweeps and shale-oil workers. The author gives special information obtained from the Registrar-General as to the distribution of cases of cancer of the skin in England and Wales. He concludes that cancer due to pitch and soot shows a considerable difference in anatomical distribution. Among pitch workers it occurs upon the head and neck, the cheek, lip, and eyelid, while soot in chimney-sweeps only affects the scrotum. In mule-spinners again, where oil is the offending material, the scrotum shows especial liability. Aniline workers are affected in the bladder. The author has made an intensive study of cases reported in literature, as well as a careful statistical presentation of all information he was able to obtain. The article is one of considerable importance.

THE LANCET.

LONDON: SATURDAY, APRIL 25, 1925.

THE PROBLEM OF THE MYOPIC CHILD.

IN his recently published book, "School Vision and the Myopic Scholar,"[1] Dr. JAMES KERR draws attention to an educational problem the solution of which has only as yet been just begun. We have blind schools for the "educationally blind," and in London we have "myopic schools" or "sight-saving classes" for high myopes and other children who, although they are certainly not blind, suffer from such defects of sight as render them obviously unfitted for the ordinary school routine. What we have not at present, either in London or elsewhere, is special provision for that large percentage of children, most of them low myopes, whose sight is in danger of being made worse as the direct consequence of the close application to books expected of them during their school years. Dr. KERR, who for many years organised the work of medical inspection in the London elementary schools, tells us that there are about 2000 children in London requiring education in the existing myope classes, but there are at least ten times that number who would benefit visually by a simpler sight-saving education than is afforded by any arrangements at present in force. The great majority of these are myopes of a moderate degree with a tendency for the myopia to increase under unfavourable conditions. The importance of this is shown by Mr. N. BISHOP HARMAN'S statistics,[2] proving that in later life myopes are liable to "failure in work" in direct proportion to the degree of their myopia, those engaged in clerical or other forms of close work being always far more subject to breakdowns than those of a similar degree of myopia not engaged in close work. What is not sufficiently realised is that the danger of myopia in childhood begins with comparatively low degrees. "Any child of 11 to 12 years of age," says Dr. KERR, "with myopia equal to four dioptres or more is likely to be harmed by further academic work in the sense of reading or writing, or fine work like drawing or sewing. These particular children are often precocious intellectually. They have gained a scholarship, their ages average 11½ years, and they must stay at school till 14 at the earliest; they have probably attained Standard VII., hence to remain at the primary school is merely marking time. On the other hand, they cannot be regarded as blind or semi-blind, and the myope schools are probably below their standard of scholarship."

What, then, is to be done with regard to the education of these children? As an immediate measure of protection, says Dr. KERR, every child with two dioptres of myopia by the age of 11 should be put under half-yearly reports, partly for safety and partly for parental education, and with −3 D. or more should be rejected for scholarships. Instructions to the teachers should distinguish between the slightly affected cases—"children for easy treatment"—who may be permitted to continue their studies under certain restrictions, the most important of which is the prohibition of all home-lessons—and those whose cases are more serious who should be recommended for oral teaching only. What is desired is an extension of the present system of myope or "sight-saving" classes to include as many as from 8 to 10 per cent. of the whole number of children in the school. In these classes the use of books, pens, paper, pencils, and slates of any kind is prohibited, and instead each child has a large blackboard on which he writes with chalk. On the other hand, for all lessons that can be learned by listening to the teacher the children in the myope class go into the ordinary school. A speciality is made of various forms of handicraft and most of the myopes are able to join with the other children in learning to dance and drill, though in the case of myopes exercises involving holding the breath, such as diving and swimming under water, or the "tug-of-war" are to be avoided. With regard to the less serious cases, Dr. KERR'S proposals will appear to some to be unnecessarily drastic. It may be true, as he says, that 50 per cent. of the present "standard" work is of scanty permanent life value; it may at least be true for the majority of the children, but to cut off such a large proportion of children as is proposed from all books might certainly bear hardly upon some, and Dr. KERR himself confesses that many of the best pupils in the present myope schools are almost marking time for the last two or three years of school life. The remedy appears to be, on the one hand, the establishment of classes for myopes in secondary schools, and, on the other, a careful selection of the low myopes needing special teaching. Would it not be permissible, for instance, to concede that any whose myopia was shown by medical inspection not to be increasing after, say, a year's probation might be restored to the book-reading classes? Such a proviso might make the proposed regulations more easy of acceptance both by teachers and parents, and, we may add, by ratepayers, for we must not forget that any extension of special classes must involve additional expense.

[1] G. Allen and Unwin, Ltd. 5*s*.
[2] THE LANCET, 1922, ii., 914.

DETERMINATION OF SEX.

THE mysteries of sex have a great fascination for the human mind, whether this be in the form of the natural or prurient curiosity of youth, the more anxious desire for information of a responsible age, or the efforts of the biologist to understand their bearings in natural law and evolutionary progress. Our daily journals have of late been regaling their readers with semi-bowdlerised versions of recently expressed views on the subject, from which it would appear that women may not only "have children at their desire," but—a matter about which the Psalmist maintains a modest silence—may have them, to order, of any sex that happens to suit their particular requirements of the moment. Such, at least, seems to be the physiological Utopia whose coming is dazzling the anticipatory imaginations of the general public. Fallacious theories of sex-determination, on which ineffective practice rested, have not been unknown in medical history, but the theory which is *sur le tapis* at present is said to be new, true, and therefore worthy of credence. We do not wish to throw dark doubt or suspicion on the simple faith that lies behind this claim, or to do more than suggest that it should be received with caution. So far as novelty is concerned, the views published a good many years ago by Dr. RUMLEY DAWSON (with a second edition in 1917) seem to be of an essentially similar nature: he was, we believe, the first to suggest that

the sex of a child depends on the maternal ovaries, discharging their ova alternately, and that the father consequently has about as much or as little to do with the result as has the maker of a match with the type and violence of the explosion following its use

So far as concerns the association of male and female with the right and left sides respectively, the assumption of connexion is at least as old as HIPPOCRATES, and perhaps as old as the hills, and is a general belief in some form or another among all nations and peoples. Mankind, in all these ages, has had large experience of childbirth and its accompaniments, and the very persistence and universality of the belief would, apart from other things, tend to induce hesitation in lightly discarding it, while the inherent improbabilities of alternate action of the ovaries do not seem to be great or in any way insurmountable; but, even if these beliefs turn out to be in some or any way justified, it is very probable that they would have to be viewed in the light of a third condition which is gaining increasing weight with the progress of investigation. We refer to the sex difference in the chromosome content of the gonocyte nucleus. Many of our readers are, no doubt, aware that there is a sexual variation in chromosome number, in which certain elements, known as heterochromosomes, do not behave like the other chromosomes during maturation of the sex cell; experiments have shown that it is these elements which are intimately concerned with the production of the sexes. Such cytological observations are, of course, of a highly technical sort, and have to be proved and tested in many ways before they can pass into the charmed circle of things accepted; but the enthusiastic research devoted to the question is slowly reaping its harvest, and the number of animal forms brought within the operation of the law is increasing. Observations on the human sex cells are still in the contentious stage, and many difficulties have naturally to be surmounted, but there seems to be every reason to anticipate an ultimate solution comparable with those reached in other types. To take one of the views held, the female cell, before maturation, has two heterochromosomes in addition to the ordinary number; these are of the same type, termed X-chromosomes. At the first maturation division they do not divide in mitosis, but move apart, so that each daughter-cell has one X element in its half-nucleus. In the second division all the elements divide in mitosis, so that the mature ovum has one X-element in its nucleus. The male cell has one X- and one smaller Y-element in its immature state: these move apart in the first division so that one of the daughter-cells has an X-element and the other a Y-chromosome: in the second division these divide, whence, of the four resulting spermatids, two have one sort and two the other variety. At fertilisation, if the mature ovum conjugates with a spermatic nucleus containing an X-chromosome, the new nucleus contains two X-elements, and is therefore female: if it meets with a spermatozoon with an accessory Y-element, the resulting nucleus contains X and Y and is consequently male.

Such a view, of course, puts the chances of sex-determination to the account of the paternal contribution. This seems to be the usual arrangement among animals so far investigated, although the reverse holds in certain birds and some insects. The conditions in the human ovum and male cell are, as we have said, at present matters of controversy, but there is no doubt that these conditions will, in the future, be considered of primary importance, and will take the main place in theories about sex-determination.

THE OPIUM CONFERENCES AT GENEVA.

WE have from time to time[1] endeavoured to trace the progress of measures, both national and international, calculated to control the traffic and check the abuse of drugs of addiction, such as opium, morphia, cocaine, and heroin. In this country the Dangerous Drugs Acts of 1920 and 1923 gave legislative effect to the International Opium Convention signed at The Hague in 1912, so far at any rate as internal trade was concerned. The international aspect of the question, entrusted by the Peace Treaties to the League of Nations, has entered upon a new phase by reason of two international conferences which held prolonged sessions at Geneva from November to February last. The first conference produced an agreement, a protocol, and a final act signed on behalf of France, India, Japan, Netherlands, Portugal, Siam, and Great Britain, in the case of the last three with declaratory reservations. These instruments purport to ensure the execution, and strengthen the undertakings, set out in Chapter II. of The Hague Convention of 1912 in regard to "prepared" opium or opium for smoking. That chapter pledged the contracting powers to take measures for the gradual and effective suppression of the manufacture of, and internal trade in, "prepared" opium and the prohibition of its import or export either immediately or as soon as possible. The new instrument seeks inter alia to make the business a Government monopoly, and its authors, impressed with the magnitude of smuggling, postponed the suppression of the use of "prepared" opium to a period of not more than 15 years from a time when a Commission, appointed by the League of Nations Council, shall have reported that the export of raw opium from producing countries no longer constitutes a serious obstacle to the reduction of the use of "prepared" opium in consuming countries. The American delegation urged that the suppression of the use of "prepared" opium for smoking should take effect in 10 years, or at most 15, from ratification of this agreement, and not from some indefinite future date; they were, however, over-ruled. It was this point of divergence, together with another more serious one arising at the second conference, which led to the withdrawal of the American delegation, followed by that of the Chinese.

The second conference, which began with 41 States represented, was chiefly concerned with the national and international control of the dangerous habit-forming drugs dealt with in Chapter III. of The Hague Convention. The preparations of Indian hemp are now added to those of opium, morphia, heroin, and cocaine as scheduled drugs. The second conference resulted in a convention, a protocol, and a final act. Mr. ZAHLE, the able chairman of this conference, in summing up the results of the labours of this the largest and most difficult conference in the history of the League of Nations, made no claim to complete success. He said that it "had not removed the world's drug evil; but that, on the contrary, it had left behind questions which will not be solved for years, possibly even decades." He nevertheless claimed that it had secured publicity for the "terrible scourge from which so many different branches of the human family are suffering," and that it had created "a real mechanism for the day to day execution of The Hague Convention." He held that "the keystone of this control is the Central Board of eight permanent and disinterested experts," to be appointed by the Council of the League of Nations, charged with the collection of statistical and other information as to the import of the scheduled drugs and their consumption as well as the invigilation of international trade therein, and armed with recommendatory powers as to limitation thereof.

Mr. ZAHLE frankly admitted that "if manufacture and transit have been well cared for the same success cannot be claimed for production." It was here that

[1] THE LANCET, May 29th, 1920; Jan. 15th, April 30th, Dec. 10th, 1921; May 20th, 1922; and March 10th, 1923.

the American propositions, accepted in principle by the Assembly of the League, failed to secure adoption by the second conference. These propositions were: (1) "If the purpose of The Hague Opium Convention is to be achieved according to its spirit and true intent, it must be recognised that the use of opium products for other than medicinal and scientific purposes is an abuse and not legitimate"; and (2) "In order to prevent the abuse of these drugs, it is necessary to exercise the control of the production of raw opium in such a manner that there will be no surplus available for non-medicinal and non-scientific purposes." Mr. ZAHLE allowed that "no voice was raised, and indeed no voice can be raised, against the justice of the principles enunciated by the American delegation." They were, however, regarded by many of the delegates as too idealistic. They appeared to conflict with the long-established habit of opium-eating in India, officially regarded as "legitimate." Moreover, such great opium-producing countries as Turkey, Persia, and China, even if they have the will, do not appear to have the power, at the present time, to limit the profitable production of opium to the slender requirements of medicine and science. As Mr. ZAHLE observed: "The producing countries realise that in total they are providing far more drugs than the world needs." He even went so far as to say that the conference had learnt that these drugs are "sedulously sought by a small coterie of people willing to poison their fellows for profit." Thus, the Geneva conferences, unable to realise the ideal, fell back upon more or less successful endeavours to idealise the real.

Annotations.

"Ne quid nimis."

REGIONAL ANÆSTHESIA.

THE methods of local and regional anæsthesia have received in this country less notice than they deserve, and this is to be attributed rather to the perfection to which our anæsthetists have brought the methods of general anæsthesia than to any want of enterprise on the part of British surgeons. Those who have visited surgical clinics abroad must have been struck by the small attention given to the technique of general anæsthesia, and for this reason we do not wonder that surgeons in those various countries have turned more and more for assistance to methods of injection. We in this country, on the other hand, are apt to forget that an unconscious and immobile patient is by no means safe from the shock of nervous stimuli, and to ignore the wonderful protection which local methods afford. Once again we see that medicine has no national bounds and that we must all learn from each other. The introduction of non-toxic substances, of perfected equipment, and of simplified technique have now made it possible to carry out any operation painlessly without other aid than local methods, and even under general anæsthesia there are few major operations in which the use of local and regional methods are not of advantage both to the surgeon and to his patient.

Of modern methods one of the most important is paravertebral anæsthesia, to which Mr. Stanford Cade, Hunterian Professor of the Royal College of Surgeons of England, calls attention in the Hunterian lecture published in this issue of THE LANCET. It was introduced by Läwen in 1911, and extended by Kappis and Ziegel, who in 1919 had performed 2000 operations by this means. In this method each spinal nerve must be injected with novocaine as it emerges from the intervertebral foramen, until the nerve-supply to the region of operation has been completely blocked. It is applicable to any region, but it requires considerable skill and it is a little tedious. In the neck it gives an excellent anæsthesia for operations on the thyroid, but in the dorsal region it is of peculiar value. Under it the most extensive operations on the thorax can be carried out with a degree of safety and an absence of shock unequalled in any other method, and this in patients whose pulmonary condition renders them bad risks for general anæsthesia. A more recent development, splanchnic anæsthesia, is dwelt upon in our columns this week by Mr. Stanley Hillman and Dr. R. E. Apperly. This ingenious method, which we owe to Wendling and Kappis, depends on an infiltration of the semilunar ganglia and the splanchnic nerves, where they lie in loose cellular tissue on the body of the first lumbar vertebra. This region can be reached from behind with extreme facility and safety, and the whole procedure takes very little time. As a result an almost complete block of afferent impulses from the stomach is obtained, abdominal relaxation under light anæsthesia is so complete that manipulations are greatly facilitated, and the absence of shock is astonishing. Whether used by themselves or as adjuncts to general anæsthesia, there can be no doubt that these methods place a very powerful weapon in the surgeon's hands, adding enormously to the safety of his work, and in many cases enabling him to carry out radical operations with success in conditions which would otherwise be beyond his powers.

HOSPITALS AND ACCIDENTS.

LAST year, according to a Home Office return that has just been published, there were 98,215 street accidents in Great Britain; in 1923 the number was 83,101. There has thus been an increase in 12 months of more than 15,000. Of these accidents 3631 were fatal as against 2979 in the previous year, and all but an inconsiderable fraction of the deaths were caused by mechanically propelled vehicles—indeed, the motor was concerned in more than two-thirds of all the accidents. Curiously enough the pedal cycle is becoming increasingly dangerous both to the rider and the public, and in 1924 it was responsible for 241 of the fatal accidents—32 more than in the year before. The more thickly congested traffic becomes the more accidents there are likely to be, but it is beyond question that the perils not only of crowded streets but of country roads are enormously increased by reckless driving and the mania for speed. The Jehu of the motor-cycle is an especially furious driver, and he is little disposed to moderate his pace even when he has a female pillion-rider behind him, though it must be admitted that these young ladies have developed amazing skill in balancing, chiefly, perhaps, by cultivating the difficult art of sitting perfectly still. The pedal cycle is, however, a constant source of danger in busy streets. The pedestrian who sees a clear crossing is daily disconcerted by the sudden darting out of an unsuspected cyclist, who perceives a golden opportunity of saving the ten seconds or so which appear to be vital to his purposes. The consequences we see in the 18,363 street accidents in which pedal cycles were concerned last year—nearly 3000 more than in 1923. It must, moreover, be remembered that the total of nearly 100,000 accidents is made up entirely of misadventures which came under the cognisance of the police, and takes no account of the large number of minor mishaps which just missed being serious and were not reported.

The large and rapid increase in traffic accidents is in many places causing serious trouble to the hospitals, which find the beds sorely needed for the reduction of their waiting lists blocked by street casualties. A glance at the report of almost any large hospital for the past year will show how considerable is this obstruction. Thus we find that Leeds General Infirmary, which had a waiting list of 1347 on the last day of 1924, was compelled during the year to treat more than 18,000 casualty and emergency cases, 410 of which were the outcome of motoring accidents. Wolverhampton Hospital admitted 1168 accident and emergency cases, in addition to treating 9303 out-patients suffering from accidents. The East Suffolk Hospital at Ipswich reports "a great increase" in the

number of street and road accidents, and this in a district mainly rural. These are instances taken at random from reports which chance to be available at the moment; they might be paralleled in scores of other cases. The Ipswich board of management suggests, as so many other people have done, the permanent reimposition of the obligation upon cyclists to carry rear lights. This is clearly desirable as a measure of general safety, but the vast majority of traffic accidents occur in daylight, and they are caused in the main by ignorant, reckless, or furious driving. Many drivers know little of the rules of the road, and many of those who do are careless and selfish. But the real danger, and the cause of the majority of accidents, is excessive speed. The precise nature of the safeguards that will presently have to be adopted is open to argument, but we cannot afford to allow accidents to increase at the rate of 15,000 a year and to put a consequent strain upon hospitals which gravely augments the congestion from which most of them are suffering.

SURGICAL TRAUMA AND SYPHILIS.

IN a paper based on the records of 78 cases in the Section on Dermatology and Syphilology of the Mayo Clinic, Dr. William H. Goeckermann[1] discusses the effect of surgical trauma in patients suffering from syphilis, with special reference to the healing of the operation wound. Of the 78 patients 50 had received some treatment for syphilis, and 28 had not been treated. Only one of the patients in the former group showed any delay in the healing of the wound. The case was one of cancer of the breast in which extensive resection was carried out. The infection was obviously pyogenic, and healing was not stimulated by antisyphilitic treatment. Three patients in the treated group died shortly after operation, but without syphilis being obviously responsible for the fatal issue. In the second group, in which antisyphilitic treatment had not been adopted for various reasons, five patients showed distinct delay in the healing of their operation wounds, but in three of them a gumma had been incised under the mistaken belief that the lesion was an abscess. The writer is of opinion that a considerable number of patients with syphilis are operated on without the surgeon being aware of the condition, and considers that the operation risk could be reduced to a minimum by a routine Wassermann test and proper treatment in certain cases.

THE HARBEN LECTURES.

THE Harben lectures for 1924 are published in the March and April issues of the *Journal of State Medicine*. In them Prof. E. L. Collis collects a mass of statistics dealing with the prevalence of tuberculosis before the war, during the war, and since the war in many countries. Sweden, Australia, Prussia, the United States, Czecho-Slovakia, the Netherlands, Denmark, and Japan all come under review. Ireland, Scotland, Wales, and England are dealt with in the second lecture. The figures will be of special interest to epidemiologists. After a careful survey of the data, Prof. Collis allows himself to draw two deductions. (1) That phthisis mortality in early adult life is an expression of resistance, lowered by malnutrition, and is particularly manifest in the female sex during puberty and the child-bearing period of life. By malnutrition he means a food-supply inadequate to the demands of activity. Thus a supply adequate for domestic life may be inadequate for industrial activity. (2) That phthisis mortality in late middle-life is an expression of resistance lowered by wear and tear and is particularly manifest in the male sex. Prof. Collis concludes with a consideration of occupational records. Amongst his other deductions he points out that the aggregation of workers in indoor occupations favours the spread of tuberculous infection, and that infection from adult to adult thus becomes a main influence in the spread of pulmonary tuberculosis. He also shows that dust which impairs the vitality of the lungs predisposes to tuberculous infection at that late period of life when wear and tear on tissues is becoming most pronounced. Silica dust, he says, exerts a peculiar influence in damaging the lung tissues and probably by its toxic action in also causing fibrosis of the kidneys. The findings of Prof. Collis are in general agreement with those of other workers and observers. It has frequently been pointed out that the male mortality from tuberculosis is almost always in excess of that of the female, and that this excess is much more pronounced in the case of inland manufacturing towns than it is in seaports where much of the work is out of doors. As regards the effect of food, it was observed during the war that women who worked in factories at which there was a good canteen enjoyed better health with the harder work and the better food than they did before the war with lighter work and an inadequate dietary. "The evidence," says Prof. Collis, "is definite that from age 10 to about age 30 the tuberculosis problem is essentially a food problem."

[1] Surgery, Gynecology, and Obstetrics, January, 1925.

DR. KNOCK.[1]

EVEN as a small boy Dr. Knock was interested in medicine, and he studied the advertisements of patent medicine vendors so that at the age of 12 he was "a doctor at heart." He took a degree in ancient history and then sold shirts in Marseilles until, finding himself out of work, he applied for post as ship's surgeon, which he got after candidly admitting that he was no doctor! After six months of his "trial and error" methods he re-entered the business world and made sufficient money as a dealer in monkey-nuts to enable him to take a medical degree, receiving honourable mention for his essay entitled "The Misuse of the Word Cure in Medicine." In the first act of this play by Jules Romains, produced last year in Paris, which Mr. Harley Granville-Barker has now translated, we find Dr. Knock just arriving at a country railway station near the village of St. Maurice and being met by Dr. Parpalaid from whom he has bought, by letters and without inspection, what proves to be an almost negligible practice. In the next act we find Dr. Knock in his consulting-room, complete with wall-charts and modern apparatus, arranging with the town-crier to have a scheme of free consultations on Monday mornings cried around the village. He interviews the schoolmaster with regard to lectures on hygiene and the local chemist as to closer coöperation. "Every single soul in the place," he says, "is, ipso facto, a potential patient." Presently there arrive those who wish to take advantage of the free consultations. Some have come as a joke, the farmer's wife to have a look at the new doctor, a faded "lady" to get advice on the cheap, but they all leave the consulting-room quite convinced that they are seriously ill. The third act takes place in the hall of the local hotel, now full of patients, and Dr. Parpalaid arrives to collect the first instalment of the purchase money. He is at first astonished and then horrified at the results which Dr. Knock has obtained in the course of his first three months, and there is an amusing speech by Dr. Knock extolling the great science of medicine which ends with a rapturous description of "two hundred and fifty clinical thermometers lifted in unison and gently placed and held beneath two hundred and fifty silent tongues!" Dr. Knock's forceful manner succeeds in overcoming his predecessor's scruples and the play ends with the rather pathetic spectacle of the old man asking for advice about his own health.

The play is a clever ridicule, not of scientific medicine but of the mentality of the public, and even if Dr. Knock's methods were reprehensible—and they were though to some extent he deceived himself—he was aided and abetted by the entire village which to a

[1] Dr. Knock: A play in three acts. By Jules Romains. In an English version by Harley Granville-Barker. London: Ernest Benn, Ltd. 1925. Pp. 95. Paper covers, 3s. 6d.; cloth, 5s.

man and woman welcomed his presence among them. Mr. Granville-Barker has had a difficult task in providing an English version which is not a translation, but a real adaptation for the English stage. Just here and there the crisp French epigram has given place to an English sentence which is not quite so telling, but on the whole the rendering is an exploit.

SCHOOL FEEDING.

THOSE interested in food at schools will find in *Science Progress* (April, 1925, p. 643) a readable common-sense survey of the subject by Dr. G. E. Friend, medical officer to Christ's College. Institutional dietetics labours under many disadvantages from which the domestic life is free. Fair criticism seems to be hardly possible; the recipients habitually criticise everything adversely to such a degree that the providers are driven into maintaining even the indefensible positions into which ignorance, carelessness, and monotony may have led them. It is, too, no doubt true, as Dr. Lyttelton has lately emphasised, that a certain amount of discipline in food is a most desirable part of the training in self-control which every school must of necessity undertake. Here, again, there is the perennial difference of opinion between the pupils and most of the parents on the one hand, and the schoolmaster on the other as to when fair discipline ends and tyranny begins. Dr. Friend is neither pupil nor master, and his testimony is of the more value. With an average age of about 14½, he judges that about 3000 or perhaps 3200 calories a day is the right amount, given in three meals at 8, 1, and 6, with a supper snack for the older boys. Work in school before breakfast, and even chapel, he entirely condemns, and holds that breakfast must be a substantial meal—meat, fish or porridge, with jam or marmalade, and unlimited bread and butter. Too short a time is often allowed for meals, and he points out that the smaller boys who get served last are apt to suffer most. Lack of variety and adaptability, bad and slovenly service, and poor cooking are other faults which he mentions. He urges that these defects become less apparent if the whole school of, say, 500 boys, is served from a central kitchen rather than in separate houses, because really expert superintendence can be secured. Little is said about vitamins. Dr. Friend evidently takes the sensible view that they are apt to be overdone nowadays with some neglect of calories and protein. But he is emphatic that butter must be provided, and not margarine. The known difference is that butter promotes growth and margarine does not; and this raises one of the many curious questions which have come up in the recent flood of interest in what we eat. It is generally accepted without question that it is wholly desirable that young persons should be grown to the maximum possible size, and that a boy 6 feet high is a better product than one 6 inches shorter—a reasonable build being always premised. Putting aside all but purely materialistic considerations, one wonders what justification there is for this. The youth of to-day certainly provide the most lovely spectacles of big growing boys and girls; they are a joy to look at, but are they going really to be healthier or more effective citizens than their meagre grandparents? They will certainly be more expensive, for they have more to keep up. There is a clinical impression that largely built people stand illness badly; the late influenza was repeatedly reported to be particularly fatal to the hearty and robust, and it is possible that the American insurance companies may find out later on that over-size is as disadvantageous as over-weight. Life often seems to last extra long in tiny bodies. But even if small people are healthier, the prestige of size may still encourage the young to grow as much as they can. Small people are often rather touchy on the subject of stature; so much so that it might be inadvisable to give the stature of some of our greatest people, lest that should be the one of their qualities which they least desire to be broadcasted.

THE BRITISH SOCIAL HYGIENE COUNCIL.

THE National Council for Combating Venereal Diseases (Incorporated), of 102, Dean-street, Oxford-street, London, W., will henceforth be known as the British Social Hygiene Council. The resolution to effect this change of name was passed at an extraordinary general meeting of the Council held on April 6th, and it will be submitted for confirmation at a second meeting of the Council to be held on May 4th. The arguments in favour of this change, as set forth by the Council, are interesting in that they show the progress which has been made in embracing the widest aspects of the venereal diseases problem. The Council consider that the need that originally existed for emphasising the fact that venereal disease was a public health problem is not so acute after the last ten years of propaganda on the subject. The work of the Council during the last two years has extended considerably along preventive lines. This brings the representatives of the Council into touch with many social and educational bodies that are anxious and willing to consider problems relating to the development of self-control and a higher standard of sex conduct among the rising generation. The attainment of a higher standard of sex conduct is essential for the complete elimination of venereal disease, but it is by no means necessary, nor in fact desirable, the Council holds, to give such educational lectures under the title of venereal disease, as the field covered is so much wider, and for this purpose many groups can be reached under the title Social Hygiene that would not be accessible under the old title. The Board of Trade and the Ministry of Health have both notified their approval of the proposed change to British Social Hygiene Council. In order not to break all links with the past, the Council suggests that the words "lately National Council for Combating Venereal Diseases" may be inserted under the new title on certain publications. Thus we may announce the Second Imperial Social Hygiene Conference, which is to be held in October at the British Empire Exhibition, Wembley, as organised by the National Council for Combating Venereal Diseases. This conference is the outcome of requests received from overseas, and the whole of three days, from Oct. 5th to 7th, will be given to a discussion of Imperial problems.

THE LETTERS OF GUY PATIN.

Dr. F. R. Packard has reprinted[1] with sundry additions the very interesting articles which appeared in "Annals of Medical History," Vol. IV., Nos. 2, 3, and 4. The book is chiefly made up of extracts from Guy Patin's letters to his various correspondents which give a life-like picture of medical affairs in Paris during the seventeenth century, and it opens with a useful historical résumé of the period, an understanding of which is necessary for the right appreciation of Patin's letters. These letters, which were not written for publication, contain the most amusing and often singularly caustic reflections upon his brother physicians, whether individuals or corporations such as the Apothecaries, and also upon statesmen even in the highest places, such as Richelieu or Mazarin. After the fashion of Vergil, who desired his executors to burn the MS. of the Æneid, Patin asked his chief correspondent Spon to burn his letters, but luckily for literature neither request was granted. Among the private and family matters contained in the letters Dr. Packard quotes one letter which is particularly delightful, giving an account of the death of Patin's mother-in-law. Writing to Spon, he says: "Do not weep much for the death of my mother-in-law, she was not worth it. She was a *good* woman, rich and avaricious, who feared nothing so much as death, which nevertheless seized her quite suddenly at the

[1] Guy Patin and the Medical Profession in Paris in the Seventeenth Century. By Francis R. Packard, M.D. New York: Paul B. Hoeber. 1925. Pp. 334. $4.

end at her beautiful country house at Cormeilles." Dr. Packard is to be congratulated upon having provided English readers with specimens of the wit and satire to be found in Patin's correspondence, and we hope that it will lead many to read the originals.

CHEMICAL WARFARE: LEWISITE.

IT is perhaps too much to expect that chemical warfare is a matter merely of historic interest, though most of the medical profession will continue to hope that the Washington Conference was but a beginning of a series of international debates which will in time bring about a material limitation of armaments and of the more barbarous aspects of war. Such a wish is enhanced by the study of recently published books, which put before us the main known facts concerning the poisonous substances which have been used, or which are available, in warfare. Of such chemical substances the one which at present appears the most potentially dangerous is an American invention popularly known as Lewisite. Much has been rumoured concerning this compound, and headlines in the lay press have appeared from time to time of so dramatic a nature that it appears worth while to repeat some of the more scientific data available to us. These are to be found in a volume[1] recently published by Lieut.-Colonel Edward B. Vedder, of the Medical Service of the United States army, who has collated in an interesting book all the facts concerning chemical warfare which are likely to be of use to medical officers. Lewisite, or β-chlorvinyldichlorarsine, is a heavy, oily liquid prepared by passing acetylene through arsenic trichloride in the presence of aluminium chloride. It is readily hydrolysed by water, especially in the presence of alkalis. Although its effects in actual warfare have never been tested it appears to be a weapon of even greater efficacy than was dichlordiethylsulphide ("mustard gas"). The exposure of dogs to the vapours of this substance rapidly leads to intense irritation of the eyes, nose, throat, and upper alimentary and respiratory tracts. A membranous exudate makes breathing difficult and painful, and if death is not produced within two days it usually ensues a few days afterwards from the purulent bronchitis and broncho-pneumonia which follow the initial respiratory lesions.

These effects of lewisite are not materially different from those of mustard gas, where the exposure leads to fatal issue, but it is in its effects on the skin that it appears likely to prove far more deadly if ever put into use in warfare. The irritation and burning of lewisite appear very quickly after the application of the liquid substance to the skin, and even in comparatively minute doses sufficient of it is absorbed to produce rapid death from arsenical poisoning. The lesions thus produced affect chiefly the tissues immediately underlying the seat of burning, but the lungs and kidneys show toxic effects in all cases, and arsenic can be recovered from practically every tissue of the body. When death is not produced the burns themselves tend to be of a most serious nature; extensive necrosis of the skin, subcutaneous tissues, and underlying muscles occurs, leaving infected areas which can only heal slowly by granulation. The treatment of such injuries is believed to be effected most satisfactorily by the application of weak alkalis, such as 5 per cent. sodium hydroxide or a ferric hydrate paste.

In view of the potential horrors of such weapons the defence of the "humanity" of chemical warfare made by Colonel Vedder in his introduction seems a little superfluous; but Mr. J. B. S. Haldane,[2] who attempts a reasoned defence of chemical warfare in general on the grounds of the comparative harmlessness of gas warfare, uses dialectical adroitness almost excessively. None the less, "Callinicus" is an arrangement of facts whose seriousness should not be impaired in the reader's estimate by the exploiting of humorous gifts.

[1] The Medical Aspects of Chemical Warfare. By Edward B. Vedder, Lieut.-Colonel, M.C., U.S.A. London: Baillière, Tindall and Cox. Baltimore: Williams and Wilkins. 1925. 32s. 6d.

[2] Callinicus: a Defence of Chemical Warfare. By J. B. S. Haldane, Sir William Dunn Reader in Biochemistry, Cambridge University. London: Kegan Paul, Trench, Trübner and Co. 1925.

INDUSTRIAL HYGIENE IN MOSCOW.

IN the February issue of the *Journal of Industrial Hygiene*, which has only just reached us, an objective account is given by A. Hamilton and R. Hilles of the hygiene of factories and workshops in Moscow. Industrial medicine, it appears, has become a required branch in the Russian medical curriculum, and visits to factories are part of the prescribed work. Moscow contains a wonderful Museum of Safety housed in the former palace of the Galitzin family, one room of which is given over to anti-alcohol propaganda; normally, distilled liquors are forbidden in the country. Efforts are made at institutes to fit the work to the man and the man to his work; all sorts of physiological and psychological experiments are carried out; but in the factories themselves little evidence exists yet of efforts to prevent unnecessary fatigue or to increase efficiency. The factories present extremes far wider than exist in America and Western Europe; almost alongside one another the best and worst possible conditions of work are to be found. "The theory of Soviet Russia," the authors write, "is that labour, industrial and agricultural, is the foundation of the State and that the life of the industrial worker should centre round the factory just as the life of the peasant centres round the farm. Their ideal is to have in connexion with each factory not only communal houses but also a creche, a kindergarten, a hospital, an amusement centre, and whatever else the workers need and want." Wages for men and women are the same for the same work, but the women seldom carry out the same work as the men. It is encouraging to learn that industrial medicine is engaging the service of some of the ablest men and women in Russia.

BROKEN GLASS AS A POISON.

A YEAR ago we commented[1] on correspondence in *Municipal Engineering* on the subject of powdered or broken glass as a "poison," and since that date a number of provincial newspapers have stressed the seriousness of particles of glass in bottled foods, chiefly jam. In one case reported a public analyst found that 8 out of 11 samples of jam in glass containers showed the presence of particles of glass, and another analyst found 8 samples out of 49 to be similarly contaminated. According to these reports the Ministry of Health was making inquiries into the matter. We certainly endorse the prevalent opinion that the matter is a serious one—powdered or broken glass may cause serious symptoms and on occasion even death—and that every measure should be taken to prevent the occurrence of glass in food. This state of affairs could no doubt be greatly diminished by the rejection of badly made containers and by destroying the food which when poured hot into glass containers causes the container to fly, instead of returning it after straining to be reboiled and subsequently poured into fresh containers—a practice common, we understand, among makers of cheaper brands of jam. Ideally better than such destruction would be the use of metal containers which possess additional advantages when sterilisation and keeping qualities are also considered, although it occasionally happens that successful prosecutions are undertaken for the presence of tin in the food issued in tinned iron containers. But the public are conservative and would be likely to resent an innovation such as jam in tins. So much is this the case that bottled fruit imported in tins may be transferred to bottles before sale. Nevertheless, whilst admitting fully the potential dangers, we emphatically dissociate ourselves from

[1] THE LANCET, April 12th, 1924, p. 761.

any suggestion that broken or powdered glass is a common cause of appendicitis or a cause at all of cancer. Those who are rightly ventilating this subject in the press are doing their cause harm by suggestions such as these which entirely lack foundation.

MENTAL HOSPITAL ADMINISTRATION.

DURING the week two important conferences have been held, convened by the Chairman of the Board of Control, to consider some aspects of mental hospital administration. For the Tuesday conference invitations were sent to the various bodies interested in the training and registration of nurses, with a view to obtaining some light upon the best solution of the nursing problem in mental hospitals. The Departmental Committee which reported in November last made certain recommendations in the direction of so increasing the status and emoluments of trained mental nurses as to make the career attractive to a greater number of educated women. The Committee recommended the grading of mental hospitals according to training facilities and the extension of the practice of seconding mental nurses to general hospitals, as well as the appointment upon the inspectorate of the Board of Control of a doubly-trained nurse to advise the various medical and nursing officials. The Tuesday conference dealt seriatim with the principal points raised by the Departmental Committee, the subject in each case being introduced by the medical superintendent of an important mental hospital. Finally, the matron of the Cardiff City Mental Hospital spoke of the nursing of male patients by women nurses, on which subject (by a useful coincidence) Prof. G. M. Robertson gave to the Royal Commission last Saturday the fruits of his pioneer work. Experience at Morningside has convinced all who have worked there of the therapeutic value of the female nurse in the acute male wards, where women appear to have more power than men in subduing excitement and their presence tends to reduce any tendency to roughness.

The second conference on Wednesday was asked to consider the provision of further mental hospital accommodation, and to it were invited the medical superintendents of county and borough mental hospitals, as well as one or more representatives of each visiting committee. Sir Frederick Willis in his letter of invitation remarked that the vacant accommodation in mental hospitals in this country is at the moment sufficient to last only for another year or so, adding that this is not due to increase of the incidence of insanity but simply to the natural growth of population. He went on in his letter to suggest various ways in which accommodation might be set free in existing institutions: by transfer of certain patients to Poor-law institutions, by making a wider use of absence on trial and boarding-out, by discharging others to the care of relatives, and by boarding outside the hospital itself nurses in excess of those required for the proper conduct of the institution. Many patients now in mental hospitals would be better in institutions for mental defectives were beds available for them. Nevertheless, the question of providing new accommodation could not be avoided, and it was round the supply of additional beds that discussion centred.

The annual Congress of the Royal Institute of Public Health will be held in Brighton and Hove from Wednesday, May 27th, to Monday, June 1st inclusive, Lord Leconfield, Lord Lieutenant of the county of Sussex, presiding. Discussions will be held and papers read on important subjects in each of the six sections of the Congress—namely: (1) State Medicine and Municipal Hygiene; (2) Naval, Military, and Air; (3) Industrial Hygiene; (4) Tropical Diseases; (5) Pathology, Bacteriology, and Biochemistry; and (6) Women and the Public Health. Copies of the programme and full particulars may be obtained from the Secretary of the Institute, 37, Russell-square, London, W.C. 1.

WE regret to announce that Sir John MacAlister, the Secretary of the Royal Society of Medicine, has had to resign his post on account of ill-health; a new secretary will be appointed as soon as possible.

THE death is recorded, at the age of 70, of Surgeon Vice-Admiral Sir Arthur William May, K.C.B., which occurred on Monday, April 20th, at St. Tudy, Cornwall. Sir Arthur May was Director-General of the Medical Department of the Admiralty from 1914 to 1917.

THE next social evening of the Royal Society of Medicine will be held on Monday, May 4th, at 8.30 P.M., when Fellows and guests will be received by Sir StClair Thomson, the President. At 9.30 P.M. Dr. Robert Hutchison will give a short address on Dr. Samuel Johnson and Medicine, illustrated with eighteenth-century portraits.

THE memorandum of evidence prepared by the British Medical Association has been placed before the Royal Commission on National Health Insurance, and the witnesses-in-chief are to appear before the Commission on April 30th and May 7th. These witnesses are Dr. R. A. Bolam, Chairman of Council; Dr. H. B. Brackenbury, Chairman of the Representative Body; Dr. H. G. Dain, Chairman of the Insurance Acts Committee; and Dr. Alfred Cox, Medical Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN.—The annual general meeting of the hospital will be held at Gresham College, London, E.C., on Wednesday, April 29th, at 3 P.M. The Hon. Mrs. E. L. Franklin will be in the chair, and Lord Riddell, Dr. Louisa Martindale, and Mr. G. Murray Hill will speak.

INVALID CHILDREN'S AID ASSOCIATION.—By permission of Sir John and Lady Ward the annual meeting of the Invalid Children's Aid Association will be held at Dudley House, Park-lane, W. 1, on Tuesday, May 12th, at 3 P.M. Lady Titchfield will preside, and the Right Hon. J. Ramsay MacDonald, M.P., Sir Bruce Bruce-Porter, Dr. Letitia Fairfield, Miss Madge Titheradge, and the Rev. J. C. Pringle will be among the speakers. Tickets are necessary for admission, and can be obtained from the Secretary, 217, Piccadilly, London, W. 1.

ILLEGAL PRACTICE BY A DRUGGIST.—In a case recently heard in the Nuneaton County Court before Judge Staveley Hill, the Society of Apothecaries were plaintiffs, and Mrs. Ashton, of the Coton Drug Stores, Nuneaton, was the defendant (THE LANCET, March 21st, p. 627). The action was brought under the Apothecaries Act, 1815, to recover a penalty of £20 from the defendant for having acted as an apothecary without qualification. From the evidence, it appeared that in September last there was an outbreak of small-pox at Nuneaton. Early in November a Mrs. Hutchinson found one of her children with a rash. She took the child to the defendant's shop and asked the defendant if the child had small-pox. After looking at the rash the defendant said "No," but she thought it was a chill on the blood. The defendant supplied a bottle of medicine for which she was paid 1s. Towards the end of November the medical officer of health received notification that a sister of the child in question was suffering from small-pox, and on visiting the house he found four members of the family suffering from the disease. The child seen by the defendant had an old rash and the medical officer was of opinion that this child had had small-pox for three weeks. He ascertained that during this time the child had been attending school and in consequence he vaccinated all the school-children. It was contended that as the result of the failure of the defendant to diagnose the disease correctly other children had been infected. The judge said that, having carefully considered the authorities, he was of opinion that the defendant had brought herself within the statute, and gave judgment in favour of the plaintiffs for the penalty and costs. An appeal against this decision was entered by the defendant but afterwards abandoned.

Modern Technique in Treatment.

A Series of Special Articles contributed by invitation on the Treatment of Medical and Surgical Conditions.

CXIX.—THE TREATMENT OF FROST-BITE.

FROST-BITE is a local condition due to the action of cold upon the tissues of the body, as a result of which an area more or less limited in extent is deprived of its blood-supply. The condition is produced in two very different ways. In the first the direct action of cold upon the skin and underlying structures causes constriction of the capillaries and small blood-vessels, whereby they are so narrowed that no blood can pass through them; in the second a reactive process, there is exudation through the damaged vessel walls into the surrounding tissues of the frost-bitten part, as a result of which the vessels again become constricted, and circulation cut off.

The first condition shows as an ischæmic waxy-white patch, well defined in outline, somewhat resembling the rapidly produced evanescent white area which results when ethyl chloride is used for local anæsthesia. The naturally produced condition has a somewhat dirtier, waxier appearance, with none of the "rime" characteristic of ethyl chloride. The second condition resembles the ordinary chilblain: it is aggravated by long-continued ischæmia, and by too rapid a return flow of blood. Certain factors predispose. They are those which cause a lowered vitality and a depressed circulation. The most important are: Cold (of the body generally), fatigue, exhaustion, hunger, and vitamin deficiency, especially scurvy. All these not only render the parts more liable to frost-bite, but by their mental effect cause the man to be less vigilant of its onset, a most important factor. Causes acting locally are winds, moisture, and grease. The parts of the body most liable to attack are the extremities, the exposed parts of the face, especially where the skin is stretched across underlying bone—e.g., the sides of the nose the cheek-bones, and the chin; the ears, especially the tips and edges; the fingers and hands; the feet, especially the toes and heels. The parts most liable to permanent damage are the feet.

The frost-bitten part, if treated early and on proper lines, recovers completely; if neglected the part dies and gangrene sets in. When the damage is superficial the skin becomes dry and black, and finally peels off, leaving a clean new skin underneath. In the case of extremities such as the toes, the damage may involve the whole thickness, so that they become dry, black, and shrivelled, producing the typical clinical picture of dry gangrene. The condition due to exudation is more serious. The part is at first dusky red, with a varying amount of swelling and œdema, and very irritable. Frequently blisters form which may contain straw-coloured serum, or in worse cases a thick purplish exudate. The part readily becomes septic, and moist gangrene follows, with absorption of toxins and severe effects upon the general health.

Signs and Symptoms.

The onset of frost-bite is often insidious, and on inspection of the part in a suspected case there may be little to see. The waxy appearance may not be present, since the primary frost-bite may have passed off, or the condition have been produced by the prolonged action of less severe cold, especially if associated with wet.

Explorers are taught to regard all doubtful cases with the greatest suspicion, and to look upon the following signs as indicating that a part is seriously damaged: (1) Cessation of circulation, as evidenced by the lack of response to finger pressure; (2) loss of heat—the affected part feels colder than the surrounding areas; (3) loss of sensation; (4) inability to use the part—e.g., if the toes are frost-bitten they cannot be freely moved (this does not prevent walking, for there are numerous instances where men, to save their lives, have hobbled along on frost-bitten feet, with disastrous results locally); (5) changes in colour, especially any suggestion of mottling, which is at first red and pink, dark red and pale pink, later becoming blue-grey, and in the worst cases purple and dirty white. It must be emphasised that these signs are often very difficult to recognise, the circumstances under which frost-bite is seen in its early stages usually being very disadvantageous.

Prevention and Early Treatment.

The importance of prevention and early treatment hardly needs emphasising, but one cannot too energetically condemn the principle, still taught, of rubbing the part with snow and snow-water. To do this to a perfectly healthy piece of skin is a joke often played upon the tenderfoot, but is never adopted in polar regions for the treatment of frost-bite. The snow has often a gritty feel, not at all like the mushy stuff of this country. In the case of the tender parts, such as the face, it may actually do harm by removing the cuticle and damaged parts of the epidermis, leaving a weeping sore which heals with difficulty, and renders the part liable to further attack. It has the good point that it emphasises the danger of too great heat, which increases the amount of exudation and local damage.

Prevention is aimed at in two ways: generally by maintaining health and a vigorous circulation, and by attempting to eliminate the predisposing factors, and locally by providing suitable clothing. Whatever form the clothing takes the principle is the same—i.e., the placing of a non-conducting air-space between the skin and the cold outer air, and preventing its dislodgment. The two chief forms of clothing used for this purpose are "furs" and "woollens," which enmesh the air in the hairs and stitches respectively. The factors which tend to dislodge it are winds which blow it away, and damp or grease which takes its place. If furs are used the skin part acts as a wind-proof, but woollens must be fitted with an outer wind-proof covering. Local prevention may therefore be summarised as follows: (1) provision of suitable clothing and keeping it in repair; (2) keeping it dry; and (3) avoiding grease.

Clothing must be loose-fitting, with no constricting bands. With regard to keeping the clothing dry, the moisture may be derived from external wet, or internally from perspiration. Practically speaking, no part offers any difficulty except the foot-gear. Waterproof foot-gear retains perspiration, that which permits of ventilation allows access of damp from outside, and it is impossible to ensure absolute dryness. As long as the feet are warm from exercise no harm results from the damp; it is during halts on the march and in standing-about jobs that danger arises. Damp socks should always be removed before getting into the sleeping bag and another pair substituted, or none at all worn, and the feet should receive a brisk dry rub. The moisture acts detrimentally by producing a sodden, unhealthy condition of the skin, and by acting as a much readier conductor of cold.

It is commonly believed that fats, oils, and grease are good non-conductors, and if placed on the clothes or skin help to keep the part warm. This is not true of the oils and fats met with in polar regions, for they are much readier conductors than the air which they replace. It is probable that the same holds true for all the fixed oils and fats, which are not readily absorbed by the skin. The volatile oils may be beneficial, for they are absorbed by the skin and produce dilatation of the blood-vessels with increased flow of blood to the part, but if used in such excess as to fill the air-spaces they are detrimental. Vaseline and glycerine have been used on the face to protect it from strong winds, and apparently with success, but in still air they have no value. Where it has been necessary to immerse the feet for long periods in cold water, as, for example, in the trenches during

the late war, whale oil well rubbed into the skin was found beneficial in preventing trench-foot, but this condition must not be confused with frost-bite, though the end-results may be similar. A man's own hair provides excellent protection, but a beard is of doubtful value, since the moisture from the breath freezes on it, forming large masses of ice. Modern explorers keep the hair well clipped with a barber's fine clippers.

The *early treatment* of primary frost-bite consists in gently coaxing back the circulation by the application of dry gentle warmth, and the simplest and safest source of this is body heat. The application varies a little according to the part affected.

Face and Ears.—The onset occurs most frequently in windy weather. The part which has been cold becomes more comfortable, but with a feeling of numbness. Very often the man attacked knows nothing of his condition till warned by a companion, since the parts are invisible to himself. It should be a recognised custom for men in company to scrutinise each others' faces frequently, those travelling alone should keep a small mirror in the pocket. A hand warm from the mitt should be applied to the frost-bite. When one hand becomes cold the other may be used, and a companion may also "lend a hand." Very light massage may be used, but no rubbing violent enough to cause an abraded surface.

The *fingers* are commonly frost-bitten owing to the fact that fine manipulations cannot be carried out with mitts, so that the fingers have constantly to be exposed. It is easy to slip off the mitts for examination, consequently the white patches are usually instantly recognised. Treatment consists in placing the affected hand inside the clothing next the skin; commonly it is thrust under the upper part of the trousers and compressed between the thighs to slow up the return flow of blood, which is often painful. Work aloft at sea causes many cases, and is particularly dangerous, owing to the difficulty of keeping a firm grip on stays and rigging. Anything which produces pressure and tends to express blood locally predisposes, and contact with cold metal is particularly liable to produce the condition. The danger is greater if the mitts are damp and exposed to strong winds.

Feet.—In spite of close vigilance frost-bite of the feet is often not detected until long after its onset. This is due to the fact that the harder skin of the heels and the balls of the feet is relatively insensitive, and that foot-gear is comparatively difficult to remove for inspection of the suspected area. It is particularly dangerous for the following reasons: (1) the difficulty of recognition as above; (2) the feet are essentially extremities; (3) in snow it is almost impossible to keep the feet dry either from external damp or from perspiration; (4) pressure and constriction are more liable to occur than in other parts. As regards *prevention*, the question as to type of foot-gear and its care is one of the greatest problems in polar exploration. Treatment, as elsewhere, is by the application of dry gentle warmth, but the harder skin of the feet permits of more vigorous massage, which is best carried out by a companion. If after some minutes there is no sensation of returning circulation, evidenced by a feeling of intense "pins and needles," the foot should be taken inside the clothing next the skin. This treatment should be persisted in for some hours before hope of recovery is given up. For the companion who has undertaken the thawing-out process it is decidedly unpleasant; others may take turns with advantage.

If recovery is delayed for some hours the part must be kept under careful observation lest the recovery be only temporary. If there is any doubt the part must be kept warm and dry, not used, and if circumstances permit, wrapped in dry cotton-wool and lightly bandaged or placed in a frost-bite sock. Ointments and greasy preparations should not be used, and any greasiness of the feet should be removed by turpentine or methylated spirit. Heat, especially damp heat in the form of fomentations, is not to be used, for there will be an excessive reaction with exudation, formation of blisters, sloughing, possibly sepsis, and subsequent moist gangrene. In spite of all care blisters may form containing clear serum or dark-coloured viscous fluid. If the skin of the blisters can be kept intact without great discomfort they should not be opened till this can be done aseptically. Dry dressings should be applied. The best and simplest in difficult circumstances is a piece of plain white lint, cut to shape, dried at a fire, over the flame of a Primus stove, spirit lamp, or at any flame which can be produced, and scorched to render it sterile. This should be covered with similarly dried cotton-wool, and the whole lightly bandaged. No matter what the subsequent course, nothing but dry dressings should be used in the field. The treatment of a gangrenous part comes within the domain of general surgery, and has no place in this article, but I would urge all field medical officers faced with the care of this really serious condition to pin their faith to dry gentle warmth, even over long periods of time, with no other application than perhaps occasional use of turpentine or methylated spirit.

Frost-bite of other parts of the body than those described are rare. I have seen one case only: frost-bite of the penis, which occurred under the most exceptional circumstances whilst a man, utterly fatigued, was attempting defæcation in the open. Even in the lowest temperatures momentary exposure of the bare skin does not produce immediate frost-bite, but the length of time that it can be exposed with safety depends upon factors such as degrees of temperature, presence or absence of damp, and strength of wind. Much depends also on the circulation: if the body has been at rest and the circulation is sluggish, frost-bite is more easily induced than if the blood is pulsating actively as the result of hard work, walking, or running. It is the common experience of explorers that a part once frost-bitten is rendered more liable to further attack. When the body generally is cold, old frost-bitten areas can be picked out by a curious feeling of numbness, a condition which persists through life and is noticed even in our own temperate climate.

A. H. MACKLIN, O.B.E., *M.C.*, M.D. Manch.,
Surgeon to the Imperial Trans-Antarctic and the Shackleton-Rowett Expeditions.

THE BATEMAN APPEAL.

As already explained in THE LANCET, it has been felt that material assistance ought to be offered to Dr. Bateman to meet the legal expenses of his recent successful appeal against conviction and to make good the deficiency in his professional income. Accordingly, the Bateman Fund has been opened and lists of contributions have appeared in recent issues. We have received additional contributions as follows:—

	£	s.	d.
Already received and acknowledged ..	431	8	6
Dr. A. H. Burgess	3	3	0
Dr. F. A. Bearn	1	1	0
Anonymously	0	10	6
Dr. S. V. Pearson	0	10	6

Remittances should be forwarded to the Manager of THE LANCET, 423, Strand, W.C. 2, and made payable to the "Bateman Fund Account."

WOMEN'S HOSPITAL WORK.—A return compiled by the Medical Women's Federation shows that there are 321 hospitals where medical women are serving or are eligible in a professional capacity. In 308 hospitals women are either on the board of management, the house committee, or both. Three out of the 19 women's and children's hospitals in London are officered entirely by women—the Elizabeth Garrett Anderson, the South London Hospital for Women, and the Clapham Maternity; the New Sussex Hospital for Women is in the same position. In 26 similar provincial hospitals women are eligible on the staff. Practically the whole of the hospitals for women and children in London and the provinces now have women on their boards or committees.

Special Articles.

ROYAL COMMISSION ON LUNACY AND MENTAL DISORDER.

FURTHER SITTINGS.

(*Continued from p. 623.*)

THE sittings of the Commission were resumed on Friday, April 17th, Mr. H. P. Macmillan, K.C., the Chairman, presiding.

Scottish Lunacy Administration.

Sir Arthur Rose, honorary chairman of the General Board of Control for Scotland, and Dr. Hamilton Marr, a full-time Commissioner of the Board, attended to give evidence. The Chairman said the scope of the Commission's reference did not extend to Scotland, but the evidence to be now given was desired for the purpose of comparison and instruction. Sir Arthur Rose said the Board consisted of five members, including two full-time paid medical officers. From motives of economy, however, the Board was not at full strength. Scotland was divided into 27 lunacy districts, not necessarily coterminous with the counties. Not every district had an asylum; a district might send its mental patients to other asylums. There were 21 asylums in the country. If a district board did not include women, two women could be coöpted. As there was no Consolidating Act, lunacy in Scotland had to be administered under a series of statutes dating from 1857.

Functions of the Scottish Board of Control.

Sir Arthur Rose said there must be two statutory meetings of the Board each year, and the Board met as frequently as business needed. Meetings of local boards were held whenever an investigation was required. Each individual patient was seen twice a year. Dr. Marr said the patients were visited in their ordinary circumstances and surroundings. Whenever an interview was requested by a patient it was always granted. It was continually present to the minds of the members of the Board that they stood, in relation to the patient, in the position of *in loco parentis*. Usually the interview was asked in order to air some delusion, but sometimes a real grievance was ventilated, such as the objection of a middle-aged female patient to bathing in the presence of young women patients. This was subsequently remedied by providing screens. In the very few cases in which there seemed to have been abuse or assault by attendants, the medical superintendent of the institution was recommended to report the case to the Procurator-Fiscal, and if that official took it up the case was tried in open court. There had been only two such cases in the last five years.

On Jan. 1st, 1924, there were in Scotland 18,266 registered lunatics (9112 male and 9154 female); 2887 were private patients. There were seven royal or chartered asylums in the country, institutions in which patients must be received if ordered to go there. In four of the seven no pauper patients were admitted. At the beginning of 1924 these seven institutions contained 3595 patients. Many of the asylums of the district boards received private as well as rate-aided patients. In Scotland only one private asylum received patients for payment at a profit. This contained 54 patients. In the 14 lunatic wards of poor-houses there were 883 patients; 1863 mental patients were living with families in private dwellings, such as farm-houses. Dr. Marr said the feeling of the Board was against the idea of a profit being made out of the care of the insane. Answering Sir David Drummond, he said a number of the private patients undergoing treatment in Scotland came from England and Ireland, and there was ample accommodation for them. Sir Arthur Rose said he believed a contributory reason was the high state of efficiency at which the Scottish mental hospitals had arrived.

Observation wards for patients with incipient forms of mental disease were instituted by the Glasgow Parish Council in 1890. They were spacious and handsome. The duration of residence was at first limited to six weeks, except in special cases, for which an extension could be granted. It was arranged that the medical commissioners of the Board of Lunacy should inspect these wards at regular intervals and report upon them. In 1923 the duration of residence was extended to six months, and additional wards were added at the general hospital at Stobhill.

Procedure.

In Scotland the procedure was the same for pauper as for private patients; there must be two medical certificates, accompanied by particulars of the case. Dr. Marr thought certificates granted after consultation was preferable to two arrived at independently, and the risk of collusion was practically negligible. One of the certificates could be given by the medical officer of the institution.

The Chairman raised again with these witnesses the question of the adequacy of the provision for patients communicating with the outside world. Dr. Marr said the sheriff could inspect asylums at any time, so could three justices of the peace and representatives of the Poor-law authority; and, generally speaking, the opportunities for communicating with the outside world were adequate. General shops for sweets and refreshments had been provided for the convenience of visitors to patients, and at Edinburgh District Asylum facilities for reading and for writing letters were provided. If a visit was refused the fact must be recorded in a book, but Sir Arthur Rose said there was no such record. With regard to discharge, the medical superintendent of an asylum recommended patients for discharge when he considered they were fit for it; he could, indeed, himself discharge a patient. In the case of admission of patients to the licensed wards of poor-houses, these were received without any order from the sheriff, and one certificate sufficed.

Boarding-out.

A matter which was fully discussed was the boarding-out system as practised in Scotland. Mental patients who, however, did not longer need material medical attention, and to whom a country life gave the best conditions, were placed in suitable homes, such as farms and small holdings. This was not quite so popular now in Scotland as a few years ago, probably, in part, because the farms and gardens in connexion with asylums were now much better managed and cultivated. These patients felt much more freedom under these conditions, and they received on the average about 12*s.* a week. It was one of the stipulations that these patients should share the whole of the home life. There seemed little risk of such patients being exploited, such as by being overworked or underfed, or both, without the Board becoming aware of it. One to four such persons could be received into one house. It was an economic system, both directly and in the capital cost of asylums.

The Chairman asked whether incipient cases could be treated in Scotland without certification—i.e., for six months on the special certificate of a doctor. The reply was in the affirmative, and that it was an excellent provision. Sir Arthur Rose said the scheme had his distinct approval, especially as it enabled patients to be seen in the incipient stage of their illness. He contemplated more treatment of mental conditions on the same lines as physical diseases were treated in ordinary nursing homes.

Morningside Asylum.

On Saturday, the 18th, the sittings were resumed, when the witness was Prof. George M. Robertson, superintendent of Morningside Asylum, Edinburgh, and professor of psychiatry at Edinburgh University.

He said the Royal Asylum at Morningside was founded by Royal Charter and endowed by philanthropic persons, and was opened in 1813. It was not carried on for gain. It was bound to receive cases from the districts it supplied, and so answered to the statutory requirements of a public asylum. The last return gave 804 patients as resident in this institution, 143 of them being rate-aided. The tariff for private patients varied from £58 to nearly £2000 a year. The treatment was on the same basis for all, the difference was in the accommodation and the attendant staff. In Craig House there were no rate-aided patients. For 46 years the institution had been closely associated with the University, which was a great all-round advantage. To the students of medicine in the University he gave every year 30 lectures—i.e., ten more than were expected—and every student was compelled to attend them. This ensured that no graduate in medicine left the University without possessing a knowledge of the principles of psychiatry; the subject was too vast to expect more. He believed students in Edinburgh received more tuition in this subject than did those at any other institution in the world. He felt so keenly that the medical curriculum was now very heavy that he had not urged that psychology should be made a subject for the final, but he would do so if the attendance and attention at the lectures fell off. For those desiring to specialise there was the searching diploma in psychological medicine, and a certain number of students had taken that.

In answer to the Chairman, Prof. Robertson said there was no provision for the sheriff in Scotland seeing the patient, and he saw no object in it, as the sheriff was not competent by examination to say whether a person was sane or insane. It was, however, valuable to have the legal scrutiny of that gentleman with regard to the certificates tendered. There had been orders signed by sheriffs when the facts, from the medical point of view, were insufficient to warrant detention, yet the sheriff in question refused to withdraw the order. Perhaps six or seven certificates in a year were sent back because they were incomplete in some detail. Answering a question by Lord Russell, Prof. Robertson said the public were entirely dependent in these matters on the honour and honesty of the medical profession. He agreed, however, that if a case went before a third person the truth was more likely to come out.

Sir David Drummond asked whether the witness considered that the second certifying doctor should be an expert in mental diseases, and Prof. Robertson replied that this would obviate many patients entering an asylum at all.

The Chairman said that in Scotland the order made by the sheriff was of three years' duration, and the witness agreed, except in the cases under the last Act which were transferred to private care. The order could be kept going by periodic renewal. The Chairman pointed out that this order did not state that the patient was of unsound mind, but only that he was a person likely to benefit from continued residence in the asylum.

Voluntary Patients.

Prof. Robertson said that from 90 per cent. to 95 per cent. of the patients entering Morningside Asylum did so without any judicial order at all, but a number came in on the emergency certificate of a single medical man for three days' detention. At the end of that time there must be confirmation by a sheriff's order. Patients and relatives "jibbed" at the idea of going before the sheriff, who was associated in the mind of the people with summonses and prosecutions. He would like certification to be done away with altogether, though admittedly there would have to be some substitute for it. He would prefer for insanity to be dealt with as a notifiable disease. The authorities would then have some responsibility in regard to each case. Instead of the present judicial procedure, these patients should be medically treated and the fact notified to the authorities. Everyone seemed desirous of avoiding formalities, and that might be taken as an indication that the formalities were wrong. In answer to the Chairman, the witness said the majority of voluntary patients appreciated that they were being treated as such, while others were indifferent about that so long as they were kindly treated. 40 per cent. of all the private patients entering the voluntary hospitals of Scotland did so as voluntary patients, and the system had the support of the public opinion of the country. Indeed, in that country there was general satisfaction with the lunacy law and its administration. The Chairman said he had never been consulted about a case of alleged illegal detention in Scotland. The system of keeping patients in private houses for six months on one medical certificate had worked well. Most of the cases recovered within six months. If a patient did not recover in that time, it was necessary to get sanction from the Board of Control to continue the treatment of such patient indefinitely.

Female Nurses in Male Wards.

Prof. Robertson said his policy had been to have matrons at the head with full authority over all the nurses of both sexes, the matrons and assistant matrons having had a general hospital training. He declared that the presence of women nurses in male wards had reduced the tendency to roughness and had brought an improved tone and atmosphere into the place. He kept one male nurse in each male ward to deal with any impulsive tendency. Women had more power than men in subduing excitement in male patients. These female nurses approached their work from the professional standpoint, and the elements which seemed to the layman unsuitable and were dwelt upon by him did not come seriously into the picture in the nurses' minds. Sexual perverts were separated from the generality of patients, and were looked after by men. The advantage of having female nurses on the male side was conspicuous therapeutically, he said. But able-bodied male patients were best looked after by men, as they could work with them on the farm and be companions for them in their amusements. Male nurses did not now resent being supplanted by women, and no male nurse had been discharged on account of the changed procedure; it was a case of waiting for resignations of male nurses to occur in the ordinary way. He agreed that the Union of Asylum Workers was opposed to the policy. It did not represent a financial saving, as the staff was now proportionally greater than at any previous period. That was especially so in the case of night staffs. There was now one nurse to about every eight patients, and seven doctors in the institution besides clinical assistants. Arising out of various questions, the witness said there were but few epileptics in Scotland; he objected to airing courts, as they seemed too much like a prison; he believed greatly in open-air verandahs and, except in certain cases, in unlocked rooms. There were no padded rooms at Morningside, and no need for them had arisen. In fact, just as restraint was practised less and less, so did the need for it seem to have lessened. Hyoscine should never be used as a continuous treatment, nor with the object of getting rid of all the excitement; but one dose was of the greatest benefit in stilling the initial mania and preventing much struggling. He also advocated a careful investigation in every case of the cause of an excited outburst, as he felt sure there always was a definite cause. He gave some interesting incidents which bore this out.

The Commission resumed its sittings on Monday, April 20th, the Chairman presiding.

Hospital Treatment of Mental Cases.

The witness in the morning was Dr. John D. Comrie, senior assistant physician to the Royal Infirmary, Edinburgh, who spoke of early treatment of mental cases at the infirmary. Mental cases had been treated at the infirmary since 1738, and the

Chairman read a minute from the records of that year which stated that as there was no proper place in Scotland for the care of lunatics, it was proposed to build five cells for their accommodation; this number was later increased to 12. In a certain proportion of cases in the infirmary there were mental symptoms, and from about 1813 a special ward had been set apart for them. Most of these cases at that date were alcoholics, and with the diminution in number of such cases, more room was available for other kinds of mental cases. The patients treated here were not certified, but were cases of ordinary physical illness in whom mental trouble had supervened, either at about the same time or at a subsequent stage. Often cases were so sent because their medical attendant was in a difficulty as to what should be done for them, and they were too noisy to keep in the home. The patients in this department came in voluntarily, and were under no legal restraint; from there they might be sent either elsewhere for convalescence, or transferred to the asylum. In the event of temporary mental aberration as in pneumonia, whatever physical restraint was necessary was exercised by the physician, and he took responsibility for it, and if the act of restraint subsequently came before a court of law the physician would probably be exonerated from blame. If such a patient were allowed up in these circumstances and it caused his death, a serious question as to neglect would have to be answered to the coroner. The patients in question were taken in and treated gratuitously, and this system, in very many cases, prevented patients from ever reaching the stage at which certification was necessary. Moreover, whatever surgical or special medical treatment was needed was available on the spot. Doctors outside showed a tendency to leave to the medical officers of the institution the question of certification. He only saw about 5 per cent. of the cases in the out-patient department before they actually entered the hospital. Some slight cases were treated in the out-patient clinic. Prof. Robertson intended to organise a psychopathic clinic. The visitation of friends here was on parallel lines with that in the general institution, and this had much influence in preserving the general hospital—as opposed to the asylum—atmosphere. In illustration of his view as to the restraint necessary, he said sometimes a patient with a fractured leg removed the splint and threw it under the bed, and raised the leg to look at it; and then it was necessary to fasten leg and splint to the bed, and limit the use of the hands. If human restraint were carried out, patients would continue to resist it, but they soon found it was useless to resist mechanical means, and soon desisted. Every effort was made to prevent noisy patients disturbing others. For this purpose it would be an advantage to have more rooms. 66 per cent. of the melancholic cases had attempted suicide before admission, but no such attempts were made while they were under care. In this department there were 24 patients, and for these there was a sister-in-charge, eight female nurses, and three male orderlies or porters. Special help in addition was always available.

Classification.

Sir Humphry Rolleston and Mr. Snell questioned the witness as to any detrimental effect on patients who needed all their nervous strength to recover from being in the same ward with noisy and more acute cases, and Dr. Comrie replied that this was so to some extent, but every effort was made to keep them apart and to diminish such risk. On the general run of cases, he said, in reply to a question by Sir Ernest Hiley, provision for 50 beds would suffice for Edinburgh. Most patients stayed about three weeks, they could be kept six weeks. In 1853 the alcoholic cases treated were 60 per cent. of the whole, and in 1923–24 this had fallen to 26 per cent., and the cases discharged sufficiently well to return home were 72 per cent. of the total, 17 per cent. being transferred to the mental hospital. Only five cases entered the mental hospital as voluntary patients. 66 per cent. of the cases of melancholia and depression had been so severe as to lead to attempts at suicide, but after a few weeks treatment 60 per cent. of them were well enough to return home, and many of them were cured, only 40 per cent., therefore, entering an asylum. But it must not be assumed that all the patients in that department were at any time certifiable. There were not many readmissions, and most of those were recurrent epilepsy. The types of cases which gave the best results were confusional insanity due to exhaustion or to toxic states, and the mental derangement occurring in the course of syphilis. Summarising his experience in a general way, he said that slight and undiagnosed cases of mental disorder admitted to a general hospital might be expected, in about 60 per cent. of cases, to recover sufficiently to return home after six weeks' treatment. Treatment in a general hospital was particularly valuable in expediting recovery because of the relative ease with which physical conditions (infective, exhaustive, or reflex) as partial causes could be discovered in a large proportion of the cases of confusional mental states, melancholia and psycho-neuroses. He also considered that the association of mental patients with those who were normal mentally in a general hospital expedited recovery and established public confidence.

Mr. Snell questioned the witness as to the reason for the decline in the alcoholic cases, and in his reply he said among the contributory causes were the high prices of spirits, the amount of unemployment, and the discipline which large numbers of the people underwent in the army. Still, the alcoholic cases were not now so severe as formerly.

Avoidance of Certification.

Dr. John Carswell was the last witness to speak on Scottish lunacy practice. He said he had been in practice and lunacy administration since 1878, mostly in Glasgow. He was now connected with the Ministry of Pensions in London. He said he was led to make his suggestion for the provision of treatment for early cases by the fact that systematised study of mental disorders was entirely neglected at that date until the patient actually had been certified and appeared at the door of an asylum. He strongly felt the need for placing incipient mental cases under care without the need of certifying them, in what had come to be known as observation wards. On account of the legal and other pitfalls connected with the subject there should be appointed for this work a medical officer who would be able to carry out his duties along the lines indicated. Out of the many thousands of cases which had passed through his hands while he held the office in Glasgow, the Parish Council had not to answer a single letter of complaint. The certifying doctor should, he thought, be a specialist in mental disease, but he did not suggest the general practitioner was inefficient. He attached great importance to visitation of the patient whose case was reported upon at his own home and in his ordinary circumstances and surroundings. In the later portion of his time at Glasgow, the population dealt with numbered 600,000, and 80 per cent. of the people were those who, if they had mental illness, would require public assistance. Cases reported by the inspector of the poor were, in most instances, seen by Dr. Carswell in their own homes on the same day. In reply to a question, he said his work was remunerated by a fixed salary; there were no fees. The 50 beds under his care at the Eastern District Hospital were at the date in question the only ones available for the kind of mental cases under discussion, and they were adequate for the cases then, as medical and public opinion had not been converted favourably to the idea. With regard to the question of detention of such patients, he agreed with the attitude of mind expressed by Dr. Comrie. If a patient expressed a determination to commit suicide at the first opportunity, Dr. Carswell said he would certify him in order to prevent this.

He preferred to do this rather than deprive the clinic of its valuable atmosphere of freedom. More than half the cases treated in this department for mental disturbance succeeded in escaping certification altogether.

Mrs. Matthews asked the witness whether there was any alternative available to reporting cases to the inspector of the poor, and he replied that he would much prefer that the doctor should report to the health authority, or, still better, to a mental board of health, as suggested by the Medico-Psychological Association. On the suggestion of Sir Humphry Rolleston he agreed to submit a memorandum on the subject.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(Continued from p. 840.)

EVIDENCE OF THE JOINT COMMITTEE OF APPROVED SOCIETIES.

Mr. F. W. Daniels, Chairman, and Mr. P. Rockliff, Secretary, gave evidence on behalf of this body, which consists (Q. 8015) of Associations of a specialised type—viz., Deposit Friendly Societies, Holloway Friendly Societies, Dividing Friendly Societies, the General Federation of Trade Unions, the Co-operative Group of Approved Societies, the Catholic Group of Approved Societies, and associations of small societies.

The Oxford Resolution.

(App. XIV., 3, 4. Q. 8023, &c.) A good deal of the evidence bore reference to a resolution of the National Conference of Friendly Societies, the Oxford Resolution, from which this Joint Committee dissociated itself. It was summed up by the witnesses (8024) thus: The merger of all existing forms of public medical service, including medical benefit under National Health Insurance, into one national medical service, thereby creating one unified organisation for the prevention and cure of disease. The witnesses considered that the—

> extension and administration of medical benefit as outlined in the Oxford Resolution . . . would lead . . . to an impression (in the minds of the patients, at any rate) that, as regards attendance, it was of the nature of a Poor-law medical service, and, as regards drugs, that they were of the "stock-pot" variety.

The misgivings as to the present medical service would, in the opinion of the Joint Committee, be considerably magnified in the system proposed.

(Q. 8160.) It was suggested that the executive of the National Conference of Friendly Societies which brought forward the Oxford Resolution were stampeded by Mr. Alban Gordon (whose evidence before the Royal Commission has recently been summarised in these columns).

The Panel Service and the Question of Extension.

(Q. 8026–41.) In the opinion of these witnesses, the panel service in the provinces, whilst not perfect, is reasonably efficient. As regards London, the service, in their view, is very far from being wholly satisfactory. The general trend of their evidence seemed to be that the London Panel Committee was to blame, and reference was made to the recent disputes in London about the action of the Medical Service Sub-committee.

> The Panel Committee in London seek to protect the scallywag, who, I have no doubt it will be said, will be found in all professions, and they carry it to extremes in London in changing their representation upon the Committee and in seeking to deprive the Medical Service Sub-committee of the judgment of an independent chairman.

Asked whether they would propose to scrap the Panel Service, and if not, what would be the alternative, they replied that they were hopeful that it might be still possible to improve the existing service. With regard to extensions of the Medical Service, the following rather cryptic statement is made:—

> (App. XIV., 24, 25.) The Joint Committee desire to see the benefit given by the Act of 1911 fully conferred upon the insured—i.e., "adequate medical attendance and treatment"—and not the restricted form of (domiciliary) medical benefit defined by the regulations. Given the former, there is no need separately to specify here the nature of the extensions desired in the latter.

No Free Choice under a Whole-time Service: The Regimentation of Women.

(Q. 8185–8200.) Asked why a whole-time service as contemplated by the Oxford Resolution should necessitate an allocation to one doctor without any free choice, and therefore involve what was described in the evidence as the "regimentation" of women, the witnesses said that that seemed to follow from the appointment of whole-time doctors for particular areas.

> If you are going to have so many whole-time paid medical men under a National Medical Service in any area as to give real freedom of choice, then you are going to make it financially impossible to set such a scheme on its feet.

Medical Benefit to Dependants not Recommended.

(App. XIV., 1, and Supplemental Statement.) The Joint Committee consider it undesirable to press at this present time for the extension of medical benefit to dependants of insured persons. They do not think that there is a clear demand for it from the insured persons themselves, and notwithstanding that "panel medical opinion has crystallised" in favour of such a scheme, they think that it is impracticable on financial grounds and also that it would throw an undue burden on the profession, especially in congested areas.

Petty Surcharges for Excessive Prescribing.

(Q. 8029.) Speaking again particularly of London Mr. Rockliff said:—

> As regards drugs, miserable petty surcharges have been made upon doctors because in their discretion, which would be unchallenged when dealing with a private patient, they prescribed a 5-grain pill and it was alleged—I am speaking from personal knowledge—that a 3- or 4-grain pill would have been as efficacious. It is a sin, too, for a flavouring essence to be put into an insured person's medicine. Insurance bandages too—I think it is altered now, but previously it was so—were to be drab or grey, not white as for a private patient.

Pooling of Funds.—Pure Theft.

(Q. 8179.) The pooling of societies' funds would, said Mr. Rockliff in one answer, be "pure unadulterated theft." (Q. 8244–8365.) The evidence generally suggests that there would be a clear breach of faith if any proposals were made to take the surpluses of the stronger societies and give them to the weaker.

> (Q. 8298.) The fact that by a selection on the part of the insured persons different results were going to accrue was patent to everybody in 1911. It was patent to trade unionists, and if they induced their members to segregate themselves in occupational societies, that was, at any rate, the result of their wrong advice.

As to this, it was suggested to the witness (Q. 8301) that 14 years' experience of fact might cause Parliament to alter a good deal of what in 1911 was simply theory.

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* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247–8); The Provision of Medical Benefit (Feb. 7th, pp. 301–3; Feb. 14th, pp. 355–6; Feb. 21st, pp. 403–5); Financial Provisions of the Act (Feb. 28th, pp. 454–7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508–9); The Approved Societies and the Money Benefits (March 14th, pp. 564–5; March 21st, pp. 623–4); Evidence of the Hearts of Oak Society (March 28th, pp. 677–9); Evidence of the National Conference of Industrial Assurance Approved Societies and of the Manchester Unity Approved Society (April 4th, pp. 731–3); Evidence of Independent Order of Rechabites, of Rational Association Friendly Society, and of Miners' Societies (April 11th, pp. 784–6; April 18th, p. 839); Evidence of Mr. Alban Gordon (April 18th, pp. 839–40).

References to the printed statements issued as appendices to the reports of the oral evidence are given thus; Section A, para. 69, is shown as "App. A. 69," and references to the oral evidence thus—Q. 1369.

Additional Treatment Benefits.

(App. XIV., 26.) The Joint Committee are prepared to support the extension of the list of additional benefits so as to enable Approved Societies to make monetary grants to enable their members to secure massage, radiant heat, and other electrical treatment, blood tests, X ray, and similar advantages in dealing with illnesses. They are opposed, however, to any transfer of treatment benefits out of the hands of the Approved Societies.

(App. XIV., 27.) As regards treatment benefits generally, whilst special considerations might be advanced in regard to a benefit given nationally as a normal benefit under the Act, the Joint Committee are opposed to any transfer out of the hands of members of Approved Societies of the administration of the present system of monetary grants in aid of treatment.

Dental Benefit.

(App. XIV., 28–31 and Supplemental Statement.) The only treatment which appears to the Joint Committee to justify an effort to secure it upon a national basis is probably dental benefit. Even then it would, it is believed, still be desirable for societies to continue to administer it. Such a benefit, if given nationally, would require to be given free of cost to the insured to enable the ill-paid, and not merely the well-paid, among the insured to obtain it.

In view of the possibility of the present valuation resulting in the very large surpluses which seem probable, it would appear that 100 per cent. dental service is not an impossibility, if preference is given to it over other additional benefits, and the Joint Committee are not impressed by the suggestion that the dentists available are inadequate, although (App. XIV., 43) this "might be true of qualified dentists."

In their supplemental statement of evidence (35), the Joint Committee say:—

Should the surplus be found to amount (when the 1923 valuation results are known) to the figure now suggested, the Joint Committee would doubtless consider the desirability of utilising such part of that surplus as is requisite to provide a 100 per cent. dental service in priority to (*a*) a reduction in the weekly contribution, or (*b*) an increase to a limited extent in the normal rates of cash benefit, which were advocated in their original statement.

The Future of Insurance Committees.

(Q. 8724–5.) In later evidence on dental benefit, the witnesses said that the whole cost of this benefit might be estimated from the experience of some societies at from 5*s.* 6*d.* to 6*s.* 6*d.* per insured person—more probably the higher figure. If by making this a normal benefit is implied meeting the full cost of the benefit,

and a member's medical card, for example, entitled him to go to both a dentist and a doctor, it certainly could be argued that Insurance Committees might be entrusted with the work; but if dental benefit as a normal benefit is anything short of a 100 per cent. service, in our judgment Insurance Committees are conclusively ruled out.

(Q. 8729.) With regard to the work of Insurance Committees generally, Mr. Rockliff said:—

We are not here to press for their annihilation, but at the same time we do not lend any support to the effort to preserve their lives by stealing work which is being better performed by other persons at the present time.

EVIDENCE OF STOCK EXCHANGE AND LLOYDS' HEALTH INSURANCE SOCIETIES.

Evidence on behalf of these Societies was given by Mr. E. E. England and Lieut.-Commander E. G. Holdway, respectively.

Advocacy of Insured Persons Making Own Arrangements for Medical Benefit.

The principal matter upon which they made submissions to the Commission was as to the medical service.

(App. XV., 6–8.) The Panel Medical Service has always been most unpopular with a large number of our members. We have had many complaints from insured persons who feel that they are not receiving the attention and treatment that was promised to them, that the doctors agreed to give, and for which the members have paid.

The witnesses advocated:—

The continuance of the Panel Medical Service with an amendment of the Medical Benefit Regulations, to allow of the unrestricted right of every insured person to make his own arrangements for medical benefit with a doctor who is not on the panel.

The witnesses pointed out that although Insurance Committees have power to allow insured persons to make their own arrangements, the conditions are so strict that only a few cases are allowed.

(Q. 8455–80.) The witnesses were asked whether such an extension of the "own arrangements" method, as they suggested, would be consonant with the idea of insurance. They replied that the member would exercise the option, knowing perfectly well that only a portion of his doctor's bill would probably be met, and that the balance would remain for him to pay.

I can see no reason why the principle of insurance should be incompatible with private arrangements. There are many insurance companies which issue policies against sickness, and the insured makes his own medical arrangements. There should be obviously a certain scale, and the member would know that he had to cover any excess from his private resources.

Although it was agreed that the majority of the doctors are on the panel, and that many of the doctors from whom members of these societies obtain treatment as private individuals, were nevertheless on the panel, it was thought that the fact of a doctor being under a contract of insurance made a marked difference in his outlook.

(Q.) Your suggestion is that the doctor does not realise his responsibility to his patient?—Yes. There is also the psychological aspect of it. The doctor knows he has a certain number of people on his panel for which he is going to receive a certain sum of money, and any extra private patient means extra money for him. He knows very well that he has had that income assured to him, and without wishing to say a word against the medical profession, there is the human element that naturally comes in. He may be tired, he may be overworked, but if a private patient comes and there is more money coming in, he gives that person better treatment. There is no doubt about it in many cases. I have had cases brought to me, and I am quite satisfied that there are many cases where they have had different treatment altogether.

With regard to the contrary suggestion that as regards his panel patients the doctor feels a greater responsibility, the witness replied:—

I quite agree there is a lot to be said for your argument, but between that degree of neglect which a person may feel and the degree of neglect which one can bring before an Insurance Committee as a complaint, there is a very wide margin.

(Q. 8523.) The witnesses wished to avoid making sweeping charges against the medical profession and, indeed, they considered that the panel service was considerably improved.

It is getting better and better. When the Act first came into force there was very great prejudice against it, and that still sticks in the minds of a large number of our members.

Other Treatment Benefits.

(Q. 8430–40.) The members of these societies are mainly selected lives, so that the societies carry smaller risks, and moreover a considerable number do not claim the ordinary benefits to which they are entitled during sickness. This enables these societies to give other very substantial benefits—e.g., full dental treatment, which includes examination, scaling and gum treatment, extraction (with or without anæsthetic), filling, stopping, crowning, and the supply of artificial teeth where needed. Also optical treatment; the members go to an optician in the City, and the full cost of pince-nez or rimless glasses or astigmatic lenses are allowed; gold frames, however, are not provided. The societies also provide medical and surgical appliances, either through the Surgical Aid Society or a private surgical instrument maker.

They would resent the loss of these benefits under a pooling scheme, and pointed out that city clerks have never yet been favourable to National Health Insurance, and it was important that nothing should be done to increase their hostility.

EVIDENCE OF THE GROUP OF CATHOLIC APPROVED SOCIETIES.

For this group Mr. Joseph Moss and Mr. C. H. Waring gave evidence. (App. XVII.) This evidence comprised the following points:—

1. That there was an undue drain on the Benefit Funds owing to women members' claims before and after confinement, particularly in view of the lax way in which many doctors issue certificates for "pregnancy" and "debility following confinement" when the women to all appearances are not incapacitated from work.

2. That surpluses should be applied to treatment benefits rather than cash benefits.

3. That in meeting the cost of such treatment benefits there should be "voluntary coöperation between societies and branches, and that they were strongly opposed to Insurance Committees having the administration of these benefits.

4. That, as most of the cases submitted for examination arise from careless and unsatisfactory certification, the cost of the regional medical officers should come from the Benefit Fund.

The Personal Touch in Administration.

(Q. 8660–1.) The witness was asked what exactly was the personal touch in branch administration of which a member of the Commission said they had "heard such a lot" during the proceedings, and what it amounted to, if it could not be translated into actual cash or treatment. The witness did not attempt a definition. He said, however (Q. 8720), that under the branch system they were in fact in closer touch with the members than under any other system.

The Black Sheep.

As to the panel system generally, the main complaint appeared to be with regard to looseness of certification in certain cases, although (Q. 8676) the society felt such difficulty in preparing cases adequately for the Medical Service Sub-committee that they had not made use of the complaints machinery. It seemed to them that when society representatives got on to an Insurance Committee they lost their interest. By way of illustration, they suggested (Q. 8682) that many town councillors would be bankrupt in about a fortnight if they ran their own affairs as they run the affairs of the city.

(Q. 8705.) With regard to certification they said:—

> We have people coming on the funds through chronic bronchitis who come week after week for the benefit, and they are able to be out in all kinds of weather. We find that certain doctors specialise in a particular complaint. We know that in the case of one man nine-tenths of his certificates will be for rheumatism, and in the case of another man nine-tenths will be for bronchitis.

Generally, however, the doctors are trying to carry out their duties under difficult conditions, and it was to be expected that there would be some black sheep in the fold.

OPHTHALMIC HOSPITAL OF THE ORDER OF ST. JOHN OF JERUSALEM IN ENGLAND.—The report of this institution for the year 1924, signed by the Warden, Lieut.-Col. J. C. Strathearn, M.D., shows that the number of new patients seen was 16,225, and that of the total consultations 75,560. The number of patients admitted to the hospital was 1676 and the number of operations performed 4293. Among new cases the percentage of blindness in one eye was 8 per cent. and in both eyes 3·8 per cent., acute conjunctivitis being the most frequent cause, for during the year under notice the disease was widespread and virulent, though an improvement, now of five years' duration, was maintained. Trachoma, the chief scourge of Palestine, and largely associated with poverty and squalor, still shows a high incidence, and accounts for much of the work in the out-patient department, where the sufferers formed 83 per cent. of new cases. Until the social standards of the people are raised very little can be done for them in regard to this disease, but encouraging results follow the systematic treatment of children at school age. The majority of operations in the hospital, 66 per cent., was for the relief of trichiasis. The sanitation of the hospital is receiving the consideration of Dr. J. A. Henderson, the P.M.O., Jerusalem.

NOTES FROM INDIA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Coöperation and Public Health in Bengal.

AN interesting method of combating malaria, as well as kala-azar and cholera, by means of coöperative public health societies has been put into practice with considerable success in the Province of Bengal, where malaria takes a heavy toll. The scheme originated with Dr. G. C. Chatterjee, formerly Assistant Bacteriologist to the Bengal Government, who in 1918 was able, in three villages which had been decimated by an epidemic of malignant malaria, to organise three Coöperative Anti-Malarial Societies and to get them registered under the Coöperative Societies Act. Subsequently he founded a Central Coöperative Anti-Malaria Society "to devise and carry out measures based on coöperative principles for the eradication of malaria from Bengal," which was registered and came into existence on June 5th 1919. The outline of the scheme is as follows. The Central Society exists to organise and create a network of Anti-Malaria and Public Health Societies on a coöperative basis throughout the villages of Bengal. Each of these societies is an autonomous body which raises funds by subscription from amongst its members. The Central Society acts as an advisory body to these rural societies, and may assist them financially. It places at their disposal the result of recent researches on malaria, kala-azar, cholera, and other preventable diseases. By February, 1924, as many as 129 societies had been organised. The anti-malaria measures which a society is required to carry out are: (1) filling up ditches; (2) improving drainage; (3) preparing a map of stagnant pools and regularly kerosinating them by volunteer help; (4) clearing undergrowth in the village; (5) administering quinine to all malaria cases in the village, and (6) keeping the fever index of the village systematically. Each society provides a duly qualified medical practitioner on a subsidy basis, whose duty it is not only to treat cases of illness, but also to instruct the people in preventive methods, and to establish a coöperative dispensary in the village itself or within easy reach of it. For organising public health societies and for educating their members, the Central Society carries out propaganda by means of magic-lantern lectures, leaflets, and a monthly journal, while the kinema and the stage are also pressed into service. The society is very strongly supported by the medical profession. Not only do the majority of its members belong to the profession, but it has also enrolled about 130 medical volunteers, at least half of whom are fully qualified practitioners, the rest being senior medical students. It enjoys good financial support, including a grant from Government, which in 1921 and 1922 was Rs.5000 and in 1923 Rs.10,000. The organisers of this system are to be heartily congratulated in their efforts to awaken the sanitary conscience of the village population of Bengal, and to promote the idea of self-help in local sanitation. It is to be hoped that such methods will in the near future be more widely extended throughout India.

Administration Report of Madras City for 1923–24.

This report is a somewhat belated document, but it contains details which are even now worth mentioning as Madras is the seat of Government and the premier city in the Presidency. The number of registered births was 22,925, giving a birth-rate of 44·6 per mille against an average rate of 38·8 for the previous decennium. As might be expected, there was the correspondingly high death-rate of 37·8 per mille, as compared with 42·7 for the previous year, and 46·6 the mean for the quinquennium ending 1922. In two divisions in the north of the city the recorded death-

rates were 53·7 and 141·0 per mille respectively. It seems more than likely that in these areas the people are suffering from a recurrence of the malaria epidemic of 1912–13 which began in those same divisions. The death-rate from infectious diseases was 15·5 per mille, from dysentery and diarrhœa 7·2 per mille, while it is reported that small-pox, influenza, and relapsing fever were present only in sporadic form. Malaria is said to be responsible for 3·9 per cent. of the total deaths, a figure which has gradually increased during the last three years. About two years ago the anti-malarial staff, or the remnant of the staff left from 1912–13, was disbanded on grounds of economy. This step may prove to be a costly one to the corporation and the people. As regards child welfare work, a new centre was opened in the western area of the city and one more woman doctor was employed. Five pupils passed out of the school for health visitors, and the number of such visitors employed by the corporation rose from nine to 16. The midwifery service of the scheme continues to be popular, the total number of cases brought to the staff being 5820, as compared with 5549 in the previous year. The infant mortality-rate for the whole city was 254 per mille, which it is pointed out is the lowest ever recorded in Madras. The mortality-rate for children under the child welfare scheme was 202 per mille, but these two figures are neither of them matters for congratulation, and much more will have to be done before any remarkable reduction in the rates can be expected As regards conservancy, while the corporation has undertaken the private scavenging of a part of the city no appreciable improvement has been effected in the general conservancy of the town, and this branch of the administration requires closer supervision.

Bombay Children's Act.

Hitherto it has been a reproach to India that its protection of children was hopelessly deficient, but the Provincial Governments are now taking the matter in hand and a Children's Act has been drafted by the Bombay Government. The Bill proposes inter alia to make it an offence: (*a*) to be drunk in a public place while having charge of a child apparently under 7 years of age; (*b*) to give any child (except in case of sickness) apparently under the age of 7 years any intoxicating liquor; (*c*) to sell tobacco to a child or young person, and power is given to the police to seize any tobacco in the possession of a child or young person found smoking and to search any boy so found; (*d*) to incite or attempt to incite a child or young person to bet or borrow money, or to take an article in pawn from a child or young person.

National Health and Baby Week in India.

The health and baby week has been held for a second time, and it is probably correct to say that in recent years no movement has so quickly and successfully caught the imagination of the people. From Delhi, where Lady Reading opened the exhibition and baby show, and all over the country reports have been received demonstrating the success and the enthusiasm with which the week was celebrated. Each province was permitted to fix its own dates for the week to suit local conditions. Large sums of money were subscribed all over the country for prizes and for feeding the mothers and infants attending the celebrations. Last year the first baby week in India was held, and there can be no doubt that this year has easily eclipsed the efforts of 1924. The problem of carrying out health propaganda work amongst a conglomerate population such as one finds in India is an enormous one owing to the expense of preparing every leaflet and every poster in a dozen or more languages, but a very good start has been made, and if only more money were available a great deal more could be done as most local governments are in entire sympathy with this kind of work.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Bayer "205" and Sleeping Sickness.

Dr. Tanon has recently communicated to the Academy of Medicine the results obtained on an expedition to the Cameroons to investigate the treatment of human trypanosomiasis with Bayer "205." While admitting that the value of this product as a trypanosomicide is at least equal to that of other substances at present in use, he considers that the German preparation is not so innocuous as has been stated, for it has been found to have a toxic action on the renal epithelium. It causes albuminuria, which, although in most cases it clears up spontaneously, may lead to death from uræmia. The effect of the drug is to cause the trypanosomes to disappear very rapidly between the third and the twenty-fourth hour after the first injection. They do not reappear in the majority of cases, but some relapses have been recorded. The cases of relapse persist for a fortnight, then the parasites disappear again and do not return. Bayer "205," therefore, is not a definite cure, at least in human patients. It has no action on the parasites in the cerebro-spinal fluid when the nerve centres have been attacked, unless an intra-spinous injection is carried out, which is not a procedure to be recommended. In brief, Bayer "205" has not been found, at the present time, to be superior to other drugs in actual use, so far as human infection by *Trypanosoma gambiense* is concerned. Further, the criterion of a drug which claims to cure sleeping sickness must be its power to cause a meningeal lesion to disappear —that is to say, which can cure patients in the third stage of the disease.

A Small Epidemic of an Undefined Nature.

Several doctors of the Pas-de-Calais have recently observed, in one of the devastated regions of that department, a small epidemic of a malady which they have not been able to classify. Twenty definite cases were recorded a week after the first case was observed. The illness commences abruptly, the patient complaining of tiredness, headaches, and giddiness. Occasionally consciousness is lost, the respiration becomes rapid, the appearance haggard, and nervous twitchings occur. Then an eruption appears in the form of extended red patches, slightly raised and separated from each other by areas of healthy skin. These patches, which are erythematous but not pruriginous, are transitory, and a few hours after their disappearance small vesicles filled with a clear liquid take their place, which in turn dry up and form little epidermal flakes. The eruption definitely disappears within three or four days and leaves no trace. A very slight degree of fever is present. The majority of the patients were glaziers working in the neighbourhood of a carbide factory, where a lime kiln is in operation. The symptoms which have been observed do not seem to be caused by any poisoning arising out of the patients' occupation, nor can they be traced to the drinking water or to food. It is a question whether it may be an abnormal type of influenza, or whether the malady bears any relationship to hiccup or to encephalitis lethargica, all of which are prevalent just now in that area.

Hygiene and the Budget.

At the instigation of Dr. Léon Bernard, professor of hygiene at the Faculty of Medicine of Paris, the Academy of Medicine has protested against the reduction of monies available for public health purposes which was recently proposed by the Government, and the following resolution has been passed unanimously: "The Academy of Medicine, concerned at the proposed reduction of 132 million francs in the Public Health Estimates, considers it necessary to direct with some insistence the attention of public

authorities to the disastrous consequences which such a measure would entail, the effect of which would be to impair seriously the initiative of public and private health organisations which have already produced tangible results in the fight against tuberculosis, syphilis, and infantile mortality. This apparent economy would be more than counterbalanced by a heavy loss in human life and an acceleration of the depopulation of France."

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Irish Medical Committee.

AT a recent meeting of the Irish Medical Committee a resolution was passed by a large majority in favour of the continuance of the Medical Register as at present. A discussion took place in regard to the inadequacy of the fees given for the registration of births, deaths, and marriages. In most districts in Ireland the Poor-law medical officer is registrar, and the fees allowed are 1*s.* for each entry of a birth or death, and 6*d.* for an entry of a marriage. These are much less than the fees allowed in Great Britain for similar duties. Recently registrars have been invited to undertake additional clerical duties without additional remuneration. The Committee passed a resolution asking the Registrar-General to take the necessary legislative steps to have the fees for the registration of births, deaths, and marriages increased to 3*s.* for each entry. Resolutions dealing with the appointments of surgeons to county hospitals were passed as follows:—

(*a*) That the minimal salary for a county hospital surgeon be £1000 per annum.

(*b*) That the county surgeon should be permitted to engage in consultative practice only.

(*c*) That in both county and district hospitals only patients for whom the State is statutorily responsible should be admitted for treatment.

(*d*) That if private patients are admitted they should be treated in a hospital apart from those entitled to treatment by the State, and that their private medical attendants should have the right to attend such patients with the county surgeon.

The Committee also reaffirmed its adherence to the British Medical Association scale of salaries for whole-time medical officers engaged in public health work; and it asked for the early publication of the interim report of the Committee of Inquiry into National Health Insurance and the Medical Services.

The Irish Free State and the Medical Register.

The Minister of Local Government and Public Health recently invited representatives of the licensing bodies and of professional organisations in the Irish Free State to meet him in conference to discuss the measures that should be taken to provide for the future control of the medical profession. Mr. Burke (the Minister) pointed out that the present Act would run only until February, 1926, and he invited the opinions of the members of the conference as to the nature of the legislation that should take its place. Those present were unanimous in urging that the existing status should not be disturbed, and that the Government of the Irish Free State should exert itself to ensure that a common register for Great Britain and Ireland should be maintained as hitherto. Mr. Burke expressed himself as in accord with the views of the conference, and stated that he would put these views before the Executive Council. He asked that a small consultative committee might be appointed by the conference to assist him in matters of detail as occasion might arise. The following were then nominated as a consultative committee: Senator W. O'Sullivan, Sir James Craig, Mr. T. Hennessy, Mr. R. C. B. Maunsell, Prof. A. F. Dixon, Dr. D. Coffey, and Dr. E. Magennis.

Correspondence.

"Audi alteram partem."

THE GOLD TREATMENT OF TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—On reading the preliminary report by the Medical Research Council on this treatment, published in your issue of April 18th, I cannot help making comparisons with the results obtained by the use of tuberculin when it was revived 10 or 12 years ago, and especially in cases where reaction-producing doses were used. By the latter method many strikingly successful results were obtained, but as soon as the "reaction" method became used for the treatment of patients in dispensaries it fell into discredit, and deservedly so. When used under strict sanatorium conditions the reactions usually subsided in a few days and no very unpleasant sequelæ were produced as a rule; certainly none comparing with the severe jaundice or continuous hiccough described as occurring during the "gold" treatment. Nor were the cases of uncontrollable reactivation of the disease at all frequent when the patients were kept absolutely at rest during the reaction. One might reasonably suppose that if the 30 cases treated by "gold" had been intelligently treated by tuberculin reactions, the results would have been better. The use of tuberculin without reactions might have given even better results without the disasters if persisted in for a longer period.

In the treatment of tuberculosis the purely academic scientific atmosphere is not the ideal one for obtaining good results. In the hands of a sceptic everything fails except perhaps artificial pneumothorax now and then. The psychic effect of any new remedy is usually a favourable one, but one feels that during the gold treatment reaction stage many of the patients must have had their faith sorely tried, especially the exfoliative dermatitis victims. Some years ago I used a solution of normal saline and 0·5 per cent. carbolic acid, and in order to produce an exactly equivalent psychical atmosphere, called it a new tuberculin (O.K.) so that staff and patient were deceived. A course of injections in a series of patients was given, and four out of eight claimed a definite improvement (and showed it), two were uncertain, and two definitely negative. Probably the same result would have occurred with high dilutions of any tuberculin.

I think that the discrepancies noted amongst different workers can be accounted for by the difference in the psychical atmosphere in which the remedy was used and the type of case treated.

My point in writing this letter is to express the hope that a drug with such dangerous possibilities as sanocrysin will not be launched on the profession as a remedy without more experimental work than it has received at present.

I am, Sir, yours faithfully,

W. C. FOWLER,

Medical Superintendent, Pinewood Sanatorium.

Wokingham, Berks, April 20th, 1925.

To the Editor of THE LANCET.

SIR,—The preliminary report of the Medical Research Council on the treatment of tuberculosis by "sanocrysin" (THE LANCET, April 18th, p. 833) is not of such a nature as to encourage either physicians or patients to try this so-called therapeutic agent. The benefits obtained are very doubtful, and benefit, when obtained, can be easily explained on the assumption, which seems to be warranted from the clinical histories of these patients, that this substance has the power of causing focal reactions, which, as is well known, may in a few suitable cases produce benefit. The same thing happened during the tuberculin period, but the harmful results in the case of the gold

preparation are much worse, for besides causing an increase of the disease this preparation seems to be a deadly poison.

There seems to me to be some confusion of thought shown in the method of approaching this problem. I understand that the idea of Prof. Möllgaard is to provoke a reaction in the tuberculous lesion with the hope that some kind of repair may take place, presumably by fibrosis, for it is very dangerous to try and produce exfoliation in pulmonary tuberculosis unless the disease is very limited. In order to mitigate too great a toxæmia I understand that an anti-serum has been prepared to neutralise the effect of the toxins produced at the site of the lesion. We who have been engaged in sanatorium treatment for many years have been for the most part engaged in trying not to rouse up lesions to greater activity, but to try by rest and other means to reduce the toxæmia. It has occurred to me that in conducting a research of this kind it would be well first of all to try this serum upon cases which have not been subjected to the gold treatment, but which are already toxæmic, for if it should be found that toxæmia could be controlled we should have one of our chief difficulties removed. I would observe in passing that when any substance which has the capacity to stir up lesions is being used when a reaction has been produced, the remedy must be stopped forthwith, and if after the reaction has passed off the patient is worse, which, in my experience, is generally the case, then the remedy should be stopped at once.

I would suggest that if this method of treatment be persisted in, the dose be reduced a hundred times at least, the intervals lengthened, and a rectal temperature be taken in every case both during and before the administration of the drug. We have found here that T.R. given in dilutions of 1 in 100,000,000, commencing with 0·1 c.cm., are quite safe and have in a considerable number of cases the power of reducing the fever of persistently febrile cases, the dose and the intervals being gauged by a carefully taken rectal temperature. The same is true of colloid of calcium, in which an efficient dose in some cases may be as small as 1000th of a grain and which may produce a reaction in certain cases. In ordinary surgical tuberculosis the dose may be much greater because there is not the same liability to toxæmia. If this is true of a comparatively harmless preparations such as calcium it may be much more so of a drug such as "sanocrysin."—I am, Sir, yours faithfully,

EDWARD E. PREST.

Ayrshire Sanatorium, Glenafton, New Cumnock, April 18th, 1925.

SCARLATINIFORM RASHES IN INFLUENZA.

To the Editor of THE LANCET.

SIR,—The difficulty which besets the diagnosis of scarlet fever appears to me to increase year by year. To the public, scarlet fever is still, and perhaps rightly so, a bogey—they associate it with a long period of isolation, strict quarantine, acute ear disease, perhaps followed by permanent deafness and other serious complications. For this reason the diagnosis of scarlet fever by a general practitioner is made with considerable anxiety unless it is an absolutely typical case. If the practitioner happens to be associated with a boarding school his anxiety about the diagnosis is probably greater, because when it becomes known that a case of scarlet fever has arisen at a school, it may do that school considerable damage, and cause great worry to the staff and also perhaps more so to the parents of the scholars.

The difficulty in diagnosis has recently been brought home to me by four cases, boys at a boarding school, whom I have recently had under my care. These cases arose during an epidemic of influenza (90 cases out of 120 boys). Three of them developed a scarlatiniform rash, simultaneously, with an increased rise in temperature, five or six days after they had been taken ill with the influenza. The rash appeared on the trunk only, the influenza was associated with sore-throat and catarrhal symptoms, so it was difficult to say if there was any increased redness of the pharynx. The rash disappeared in three days, and there were no complications. The medical officer of health who saw the cases with me preferred to express no definite opinion, but advised me to isolate the cases and wait and see what happened. At the end of 18 days, no complications having arisen and no desquamation of any sort having appeared, I thought it safe to let the boys out of isolation. One of them who went home promptly started to desquamate; the other two have had no signs of desquamation. The other case during the same epidemic developed a scarlatiniform rash, which lasted two days; he had an increase in the soreness of his throat, and developed a quinsy. This case was much less like scarlet fever than the others, yet he eventually developed typical desquamation of the hands and feet. I have recently seen it stated that the rash of scarlet fever has to be diagnosed from a rash due to influenza. Were the rashes I have mentioned scarlet fever rash or due to influenza?

I should like to know if other medical men have met with any similar cases during the present epidemic of influenza. The recording of the cases, I am sure, would be of value in the differential diagnosis between scarlet fever and influenza.

I am, Sir, yours faithfully,

CHARLES BIRCH.

Whitchurch, near Reading, April 17th, 1925.

NURSING HOMES (REGISTRATION) BILL.

To the Editor of THE LANCET.

SIR,—May one use your columns to draw the attention of the profession—more particularly consultants and those who receive one or more patients into their private houses—to this Bill, which has had its first reading? It is backed by the College of Nursing and Lieut.-Colonel Fremantle, M.P. (late M.O.H.), amongst others; and they are now urging that it should be adopted as a Government measure. In its present form it would extend into the private homes of doctors the inquisitorial supervision and disciplinary regulations of the Ministry of Health, with consequential fines and penalties, so well known to insurance practitioners in their domiciliary practice. It is another instance of proposed legislation by regulations.

The definition of a nursing home is given as "any premises . . . for the reception of . . . persons suffering from any sickness, injury or infirmity for the purpose of the provision of such persons with . . . food either with or without medical . . . and where any payment . . . is made." This definition includes, and I have been informed is intended to include, doctors who receive patients of any kind. Patients who are placed, or place themselves, under the care of a doctor desiring to be associated in the home life are readily divided into four groups—namely, certified, border line, drug addicts, and those suffering from chronic forms of illness more peculiarly affecting the aged. Every doctor who receives any such patient would be subjected to the conditions outlined in this Bill if it passes in its present form.

These conditions include determination by the Minister of Health: (*a*) whether the doctor is a suitable person to receive one or more patients; (*b*) whether the nurses and servants he has engaged are suitable; (*c*) whether the lighting, heating, ventilation, and sanitary state of the accommodation for the patients, nurses, and servants are satisfactory; (*d*) whether the home is properly equipped for patients; (*e*) the exact prominent position in the house where a copy of the regulations shall be displayed for all to read; as also the exact position inside and outside the house where a notice shall be placed that the house is a "registered nursing home." Also the medical officer of health or an appointed State registered nurse, at reasonable hours, can call to

inspect the whole house and staff, the entries and records in the registers of patients, of transfers and discharges, of deaths, of clinical records, of dispensing done, of casualties, as also the reports required to be made from time to time.

Now the primary object of receiving these patients into a doctor's house is to provide for them the atmosphere of a home, whilst insuring that care and supervision by a doctor so necessary if any improvement in their health is to be hoped for. If this Bill goes through in its present form then consultants and private practitioners will find themselves deprived of just those non-institutionally conducted homes which their patients require; for there can be no question that private practitioners who at present receive these patients will refuse absolutely to place their homes, themselves, and their families in a position to be dragooned by a State organisation. That result would be against the interests of the public, the patients concerned, the relatives, and the medical profession generally. It has been said—and by doctors—that if the notice board outside the house is done away with there is nothing to object to! This shows lack of vision. Also that doctors must not expect to be treated differently from any lay person who may decide to open a home! Surely the profession is sufficiently dominated at the present time by the State. Will it tamely allow this further proposal?

May I urge all interested to at once read the Bill, and then to communicate their views to their Member of Parliament, the British Medical Association, as well as to any others whose influence could be brought to bear in order that the members of the medical profession who receive private patients be excluded from the operations of this Bill? Unless this condition is secured the Bill should be opposed with all the power still left to us. There is no time to be lost.

I am, Sir, yours faithfully,

Hove, April 18th, 1925. E. ROWLAND FOTHERGILL.

HOW TO BLOW THE NOSE.

To the Editor of THE LANCET.

SIR,—With reference to Dr. A. D. Sharp's letter on this subject in your issue of to-day's date, I would like to say that it is important that the child (or adult) should be taught to blow *into* the handkerchief and not against it, as is so usual, also to grip the upper or bony part of the nose and not the cartilaginous, so avoiding any artificial increase of intranasal pressure. This advice is especially necessary after nasal douching. Further, when there is perforation of the tympanic membrane the raising of pressure is especially to be avoided, and where the Eustachian tube is freely patent the patient should be warned to prevent the rush of air and mucus into the middle ear by blocking the external auditory meatus with the finger or thumb of the unoccupied hand.

Parents should be advised to see that children use their noses for respiration at all times, especially after operations for the relief of nasal obstruction, so that the organ may become developed for the purpose for which it is intended.

I am, Sir, yours faithfully,

London, April 18th, 1925. C. HAMBLEN THOMAS.

UNIVERSITY OF LONDON SENATORIAL ELECTION: TWENTIETH CENTURY SOCIETY OF LONDON GRADUATES.

To the Editor of THE LANCET.

SIR,—My attention has been directed to a paragraph in the issue of THE LANCET for April 18th which implies that the Twentieth Century Society of London Graduates stands for the adoption of the Haldane Report. This is not correct.

The principles underlying the evidence which will shortly be submitted, on behalf of the Society, to the Departmental Committee on University Education in London are as follows: (1) Government of the University by a representative Senate as at present, and not by a Senate mainly nominated as suggested in the report of Lord Haldane's Commission. (2) Adequate representation on the Senate of teachers, graduates, principal colleges, and contributing authorities. (3) A large measure of college autonomy in finance and administration. (4) Maintenance of the external degree. (5) Recognition of the position of teaching institutions outside London preparing for the external degree and systematic consultation of them with reference to curricula and examinations.

In fairness to Mr. T. B. Layton, the candidate who is being supported by the Society at the forthcoming Senatorial election for a Convocation representative of the Faculty of Medicine, may I ask you to insert this letter.—I am, Sir, yours faithfully,

G. F. TROUP HORNE,
Hon. General Secretary.

Malet-street, W.C., April 21st, 1925.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Borough of Hornsey.

THE first annual report for the year 1924 to reach us is that in which Dr. A. T. Nankivell deals for the last time with the health of Hornsey before taking up his new duties at Plymouth.

Most of the health statistics of Hornsey for 1924 are favourable. The population is estimated at 88,661. The birth-rate was low, 15·0, attributed by Dr. Nankivell to late marriages, to birth control, and to the practice of various methods for procuring abortion. The dozen instances of the latter brought to his knowledge only give a slight indication of the prevalence of this practice. The death-rate from all causes was 10·4, and a lower death-rate is hardly to be expected in this district, owing to the excess of elderly persons in the population. The infant mortality-rate was by far the lowest on record—namely, 36 per 1000 births. The lowness of this rate draws attention to the fact that the neonatal rate shows no tendency to decrease. No less than 34 of the 48 infant deaths occurred during the first four weeks, and an interesting chart given by Dr. Nankivell shows that the neonatal mortality-rate has remained constant during the last 40 years, whilst the rest of the infant mortality-rate has declined in a remarkable manner. In view of this, Dr. Nankivell urges the importance of skilled medical advice during pregnancy. The total tuberculosis-rate for the borough was 0·67, while the cancer death-rate gave the high figure of 1·7. There were two maternal deaths from childbirth, which is equivalent to a rate of 1·5 per 1000 births. The death-rate from respiratory diseases and influenza was 2·0. Heart disease and nephritis caused nearly as many deaths as cancer, and Dr. Nankivell suggests that as diseases of the arteries, heart, and kidneys yield very well to care and early treatment, it would be well if the custom of a periodical overhauling, as is usual in the case of our teeth, were applied to these organs.

Dealing with the milk-supply, Dr. Nankivell draws attention to several objectionable practices. Milk which has been round the streets on a barrow may be reheated and placed in cold storage and subsequently sold as fresh milk. Some pasteurised milk may be sold as "fresh" milk or "new" milk or "milk," and the obligations of the seller of pasteurised milk thus avoided. One example is quoted of a milkman who has a pasteurising plant but does not use it invariably, and sells his produce as "milk." Dr. Nankivell points out that a milkman may be licensed to sell pasteurised milk, that he may have a suitable

pasteurising plant, and that he may put the milk through the plant, lay it down in cold storage, and retail it at his convenience "under the engaging title of new or fresh milk." A most objectionable practice mentioned is that of the milkman who fills up from a churn on his barrow dirty bottles taken from doorsteps and forthwith redistributes them to his customers.

In connexion with the maternity and child welfare scheme, three massage clinics have been arranged by the voluntary committee and are doing useful work. Dr. Nankivell hopes that the provision of a convalescent home for mothers and babies will be one of the next departures. Hornsey being mainly a residential town of good-class houses, there are no slum areas, but there is a good deal of overcrowding of several families under one roof. This overcrowding is economic in origin, and will not be remedied by the council's new houses, although the latter are eagerly sought by those who can pay a reasonable rent for a good building. In his school report Dr. Nankivell says it is difficult to see the results of a slowly operating system, but that the older teachers are unanimous in appreciating the difference between the school child of to-day and the child of 15 years ago. In Hornsey there is not much malnutrition caused by lack of food, but there is malnutrition caused by the wrong choice of food. "Bread and jam, cakes and sweets too often form the bulk of the diet of the growing child; the entire absence of fresh foods from many dietaries is deplorable. Even if a man has an allotment and grows his own green vegetables, his family does not seem to eat lettuces, mustard and cress, or cabbages; tinned milk is often used instead of fresh milk, and canned fruits and fish instead of the fresh articles." "The remedy," says Dr. Nankivell, "lies in the education of the parents and especially of the children themselves; and girls at cooking classes should learn not only how to cook but also what to cook."

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 11TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 149; scarlet fever, 1568; diphtheria, 769; enteric fever, 35; pneumonia, 1318; puerperal fever, 51; cerebro-spinal fever, 10; acute polio-encephalitis, 1; encephalitis lethargica, 48; continued fever, 1; dysentery, 19; ophthalmia neonatorum, 98. There were no cases of cholera, plague, or typhus fever notified during the week. The number of small-pox cases showed a decrease of 3 from the number for the preceding week. Twenty-six cases were notified from Derbyshire (Derby C.B., 15); 19 from Northamptonshire (Kettering, 15); 20 from Northumberland; 23 from Notts (Mansfield Woodhouse, 10); and 41 from Yorks, North Riding (Middlesbrough C.B., 40).

Deaths.—In the aggregate of great towns, including London, there wese 4 deaths from enteric fever, 143 from measles, 17 from scarlet fever, 125 from whooping-cough, 36 from diphtheria, and 221 from influenza, as compared with 242, 281, 304, and 283 in the four preceding weeks. In London itself the deaths from influenza numbered 31, from whooping-cough 33, and from diphtheria 8.

THE LATE DR. E. C. PRICHARD.—Evan Christopher Prichard, M.D. Edin., of Horse Fair, Banbury, died on April 8th at the age of 47 following an operation. He was a son of the late R. K. Prichard, of Bridgend, and received his medical education at Edinburgh University, where he qualified M.B., Ch.B. in 1902, obtaining the M.D. four years later. After holding the usual hospital appointments, he took up practice in Banbury, where at the time of his death he was senior honorary medical officer to the Horton Infirmary. A colleague writes of him: "Prichard was one of those men to whom his patients' illnesses and troubles were his own anxiety throughout. He engaged in all branches of practice, but it was as a surgeon that he did his best work. He possessed that essential quality of a good surgeon, the ability to do the right thing in an emergency. In his dealings with his colleagues his most lovable characteristic was his boyishness, his open heart, his cheerful and direct speech. It is with feelings of great regret that his colleagues in this district look upon his untimely death when much of his life's work lay in front of him."

Obituary.

SIR RICKMAN JOHN GODLEE, BART., K.C.V.O., M.B., M.S. LOND., F.R.C.S. ENG.,

CONSULTING SURGEON, UNIVERSITY COLLEGE AND BROMPTON HOSPITALS: LATE PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

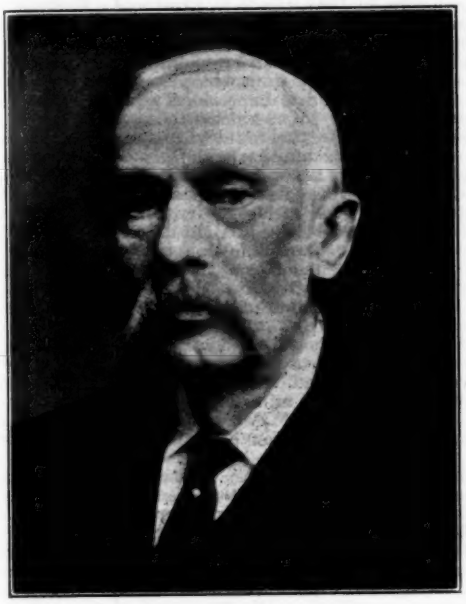
WE deeply regret to announce the death of Sir Rickman Godlee, which occurred at his house, Coombe End, near Whitchurch, on Monday last, after an illness of only a few hours.

Rickman John Godlee was born of an old Quaker family, the son of a barrister whose wife was sister of Lord Lister, and Godlee's relationship to the discoverer of antiseptic surgery had a paramount influence upon his career. He was born at Upton, Essex, on Feb. 15th, 1849, and was brought up in the usual environment of a prosperous Quaker family. He received his early education at a school at Tottenham mainly supported by the Friends, where natural history formed a definite and even a large part of the curriculum, so that from his youth he was a field botanist and ornithologist, and able to draw lessons from the biology of the countryside. He graduated at the University of London at an early age, and entered University College Hospital as a medical student, where he was remarked as an able anatomist. He qualified as M.R.C.S. Eng. in 1872 and filled the usual house appointments at the hospital, while he studied for the London degrees in medicine and surgery, being awarded the gold medal for surgery. He then went to Edinburgh, where Lister's work was proceeding and where the significance of the great discoveries had been more fully recognised than it was in London. Here he worked with Lister as an assistant and acquired full knowledge of the theory and technique of antiseptic surgery as practised in those early days, and on returning to London became surgical registrar at University College Hospital. In 1876 he took the Fellowship of the Royal College of Surgeons of England, and was elected assistant surgeon to Charing Cross Hospital and the Queen's Hospital for Children. In the following year a vacancy occurred on the staff of University College Hospital, and he was elected assistant surgeon at the hospital, becoming, as was the usual practice in the London schools of medicine at the time, demonstrator of anatomy in the medical school. The staff on the surgical side of the hospital was strong, including Erichsen, Henry Thompson, John Marshall, Berkeley Hill, Christopher Heath, and Marcus Beck, the last being Godlee's cousin, immediate senior and the colleague with whom much of his work was done. As a demonstrator of anatomy Godlee, in addition to his wide knowledge, had the great advantage of being a brilliant draughtsman, who was responsible for many of the illustrations in one of the issues of Quain's Anatomy.

Godlee's career as a hospital surgeon and consultant was quietly successful throughout. He was known to be the constant assistant to Lister in his operative practice in London, where the great surgeon was now living and attached to King's College Hospital; his colleagues and his students learned from the first to appreciate his wisdom and his skill. His name came prominently to the front in connexion with a case of excision of a tumour from the brain. This case created keen interest some 40 years ago and a full account of it will be found in our columns.[1] The patient, a man of 25, came to Hughes Bennett, a leading neurologist of the day, complaining of paralysis of the left arm, complicated with a vague story of injury on the same side of his head. Symptoms of cerebral irritation had occurred for more than two years, and finally there were seizures with loss of consciousness about once a month. When the patient came under observation he was being attacked with spasmodic twitchings of the left hand and arm, which

[1] THE LANCET, 1884, ii., 1090.

alternated with twitchings of the face; he had paralysis of the upper limb, but general health and intelligence were good, pains in the head being the main thing of which he complained. Hughes Bennett from all the symptoms diagnosed a tumour in the cortical substance in the neighbourhood of the upper third of the fissure of Rolando, and Godlee was selected to cut down at that spot with a view to any necessary operation. The risks of an operation which was an innovation were explained to the patient who cheerfully submitted with the hope of relief from intolerable pain. Godlee removed a



SIR RICKMAN GODLEE.

[Photograph by Elliott and Fry, Ltd.

triangular piece of bone over the indicated area, found the ascending frontal convolution distended, made an incision some quarter of an inch below the surface, and discovered a glioma about the size of a walnut, which he enucleated. For a time the operation appeared to be entirely successful, but subsequently the patient died of secondary surgical complications. The account of the case in THE LANCET attracted much public attention, and led to a discussion in the *Times* on the subject of vivisection, the suggestion apparently being that a human patient had been made the subject of a surgical experiment. Accordingly the whole case was discussed at the Royal Medical and Chirurgical Society, when Hughes Bennett described the operation, its termination, and the post-mortem findings, discussing the physiological and pathological points of interest. Sir David Ferrier, Hughlings Jackson, William MacEwen, and Victor Horsley took part in a debate which abundantly proved that, in spite of its unfortunate issue, the case was one of the highest importance, as it substantiated the well-known researches of Hughlings Jackson and Ferrier, and established the possibility of surgical relief for cerebral growths.

In 1884 Godlee was elected surgeon to the Brompton Hospital, with which institution he was connected actively for over 20 years, and where he did some of his best known work. Its results are modestly but accurately represented in the well-known volume on "Diseases of the Lungs" written by himself and Sir James Kingston Fowler. This work was immediately recognised to constitute an important addition to the literature of scientific and practical medicine, while it brought home to the profession in a striking manner what an extension of the surgical province had been provided by the development of antiseptic surgery and of bacteriology. The work was one of real coöperation between the authors, the contributions of each being studied by the other; it was the outcome of long joint experience at the Brompton Hospital, and the valuable aid of other members of the staff, notably of Dr. Percy Kidd and Dr. A. F. Voelcker, was received throughout. The orderly arrangement of the treatise, the precise statements where possible, and the omission of dogmatic assertions, as well as the wide range of material, marked the book off for immediate success, while Godlee's chapters on the surgery of the lung and pleuræ became an inspiration to operators, all the more forcible because the clinical teaching was accompanied by an admirable chapter on the anatomy of the parts concerned.

Godlee's long and distinguished connexion with the Royal College of Surgeons of England began by election to the Council in 1897, but he had previously examined for the College, ultimately becoming chairman of the Court of Examiners. In 1911 he was elected President in succession to Sir Henry Butlin, who died during his term of office, and he presided over the College for the three years preceding the war, discharging the duties with the punctilious and quiet completeness that were anticipated by all who knew him. He delivered the Bradshaw Lecture of the College in 1907, taking as his subject the surgery of tuberculosis of the genito-urinary organs, and was Hunterian orator in 1913. In 1912 he was created a baronet, and was made a K.C.V.O. in 1914 on the termination of his office. He was surgeon to the Household under Queen Victoria, and later Surgeon-in-Ordinary to King Edward VII., and to King George V. One of his last acts in office at the College was to go to America to deliver an address on the occasion of the foundation of the American College of Surgeons, of which he became an original Fellow. In this address he briefly reviewed the history of the College, its rise from a city company, its evolution into a Royal College, its relations with the Royal College of Physicians, and its double function as a great examining body and the trustee of the Hunter Museum. There is no doubt that the clearness of the address, and the spirit of brotherhood displayed throughout in its expressions, formed a valuable link on the eve of war between the medical activities of the two countries.

When the war broke out Godlee was too senior to serve in any consultant capacity abroad, but in many ways, and always unostentatiously, he worked to maintain our medical efficiency in all spheres. He was a punctilious member of the Central Medical War Committee, and in the early days of that Committee his shrewd and tolerant advice as to the methods by which our armies abroad could be adequately supplied with medical officers, without overdepletion of the medical service at home, was on all occasions accepted. He was also chairman of the Belgian Doctors' and Pharmacists' Relief Fund, and in that capacity served continually on a Committee which sat monthly for some two years in the offices of THE LANCET. The Editor of THE LANCET was secretary of the movement, and Dr. Harold Des Vœux was treasurer, and the subscriptions, as they were contributed in open-handed manner by the medical profession, were immediately devoted to relieve distress in suitable cases. The responsibility for the individual grants was taken by the three officers of the fund, and every day for many weeks Belgian refugees belonging to one or other of the professions were interviewed and grants were made which, during 1915, formed the only source of support for many of the miserable families. Godlee was instrumental in bringing to the notice of the General Medical Council the advantage of sanctioning the practice of allowing Belgian practitioners to qualify in England, when an appreciable number

were placed in a position of earning their own living, while others were supplied with money and facilities, in order that they might join their own fighting forces on the Western front. By the beginning of 1916 it became possible to relieve the medical men and pharmacists in Belgium itself, and for some months money was sent at the rate of £100 and later £200 a week to Brussels through the agency of the International Commission for Relief. Over £25,000 were disbursed in this manner, and the details of every grant and the destination of every cheque were scrutinised by Godlee, who was also a generous contributor in money.

After the war Godlee gradually passed more and more of his time at Coombe End Farm, a beautiful place, lying on the summit of Whitchurch Hill, above the Thames. Here he devoted his time, when official business did not bring him to London, to the farming of his property and the writing of the biography of Lister. The life of Lister appeared in 1917, and was written in the spirit dictated by its subject who had said "a scientist's public life lies in the work that is his." That is to say, the main part of the biography is a history of antiseptic surgery written by one who was intimately associated with Lister in his experimental work and its developments, and who for many years, in association with Sir Watson Cheyne, assisted him in his operative practice. We therefore find included in the book a graphic sketch of Victorian medicine in Edinburgh, Glasgow, and London, as well as on the continent, showing how the revolutionary doctrines were received, and the spirit in which they were interpreted. The biography met with the success which it deserved, went through more than one edition in this country, and is, we believe, in course of translation into German.

In private life this man of many posts and many honours was conspicuously simple, and save to his friends, a little austere. He was business-like and punctual, and got through much work, public and private, without haste or fuss. He was essentially accurate and inclined to be severe upon anything that savoured of pretence or pose. But he was the best of friends with those whose sincerity he recognised, and, whether in casual meeting or on more intimate occasions, could be an interesting and an amusing talker over a great choice of subjects. He was a linguist who had travelled considerably, he had a close acquaintance with many phases of art, and was himself a good water-colour painter. He had an unusual knowledge of botany and ornithology; he was a practical farmer and an assiduous gardener; and along the whole range of his accomplishments he was fully read and minutely documented. Latterly he lived almost entirely at his country house, where he died; and though his busy professional career had kept him all his life much in London, his joy in farming was of the sort that could only come from a real familiarity with the countryside. He loved the working of Nature.

Sir Rickman Godlee married in 1891 Juliet Mary, daughter of Frederic Seebohm, Lit.D., of the Hermitage, Hitchin, who survives him, and to whom the sympathies of all the medical profession will be extended in her loss. There were no children of the marriage.

The funeral took place on Thursday last at Whitchurch Hill, Oxon.

ROBERT JAMES McLEAN BUCHANAN, M.D. MANCH. AND LIVERP., F.R.C.P. LOND.

WE regret to announce the death, on April 19th from pneumonia, of Dr. Robert J. M. Buchanan, professor of forensic medicine and toxicology at the University of Liverpool. Perhaps the career of Dr. Buchanan was in some respects unique, for he was justly proud of the fact that before he began the study of medicine he helped to build, as an apprentice joiner, the Liverpool Royal Infirmary, in which he later served as an honorary physician. Severing his apprenticeship with joinery as a young man, he began a distinguished career as a medical student at University College, Liverpool, gaining many class medals and later a Holt Fellowship in Physiology and Pathology, in which subjects he had acted as demonstrator. In 1888 he graduated M.B., Ch.B. with honours in systematic and clinical medicine, and obtained the M.R.C.S. Eng. In the same year he won the Derby Exhibition at Liverpool University in clinical medicine and surgery, and in 1889 he was awarded a gold medal by the Victoria University of Manchester for his M.D. thesis. In 1897 he became a Member of the Royal College of Physicians of London and a Fellow in 1908, having been awarded four years previously, in 1904, the M.D. Liverpool. Early in his career he became associated with the Department of Forensic Medicine and Toxicology at his University, and held therein successive appointments, culminating in the professorship, from which he retired at the end of 1924. His clinical experience as a physician was gained through his services to several Liverpool hospitals: first to the Stanley Hospital, then to the Hospital for Consumption and Diseases of the Chest, and finally as honorary physician to the Royal Infirmary, to the consultant staff of which he was appointed in June of last year. During the war he acted as captain in the R.A.M.C.(T.) and was one of the physicians of the First Western General Hospital. He was an active member of the Medico-Legal Society and the Liverpool Medical Institution. Some years ago the Southport Medical Society elected him as their president.

Dr. Buchanan's chief contributions to medical literature include a monograph on "Rabies and Hydrophobia," and the reissue of "Husband's Forensic Medicine," minus the public health section, as "A Text-book of Forensic Medicine and Toxicology," brought thoroughly up to date. In 1909 he published "The Blood in Health and Disease," a well-known and excellently illustrated manual. He was the author of several articles in the Practical Encyclopædia of Medicine and Surgery, among them "Diseases of the Pleura and Mediastinum" and "Diseases of the Spleen and Thymus." His judgment as a physician was highly valued by his colleagues, who recognised his worth as a sound, experienced, and reliable consultant. His book on diseases of the blood showed him an expert microscopist and an excellent draughtsman, as well as an apt micro-photographer. He was a regular exhibitor of his own paintings and water-colour sketches at the autumn and other exhibitions in Liverpool—sketches more especially of the picturesque features of North Wales. Moreover, he was a keen disciple of Izaak Walton and had an intimate knowledge of the best trout streams around Liverpool. A man of singular versatility and abounding energy, he was a lover of music and a raconteur of the first order.

A colleague writes of him: "In Dr. Buchanan we have lost one of those all too rare ornaments of the profession who, in spite of the labours of the day and the demands of ever-advancing knowledge, are able, by their literary or artistic gifts, to lift the mind above common things and add to the sum of human happiness."

He lost his elder son, who had just begun to study medicine, about five years ago, a blow which left a deep impress on Dr. Buchanan's health. The sorrow of his widow and younger son will be shared by many thousands of his patients in and around Liverpool, who profited by his skill and ever-ready kindness in the wards and in private practice.

SAMUEL REGINALD ORME DUDFIELD, O.B.E., M.B., D.P.H. CAMB., M.R.C.S. ENG.

Dr. S. R. O. Dudfield, medical officer of health for Paddington, died on Sunday at the Hospital of St. John and St. Elizabeth, St. John's Wood, from appendicitis, at the age of 64. He was the son of Dr. T. Orme Dudfield, a former medical officer of health for Kensington. He went up to Trinity College, Cambridge, where he took his Natural Science

Tripos in 1882. He then studied medicine at St. Bartholomew's Hospital, London, and in 1885 qualified as L.R.C.P. Lond. and M.R.C.S. Eng., graduating two years later as M.B., C.M. Camb., and taking his D.P.H. in the following year. Dr. Dudfield's first public health appointments were as assistant medical officer to the Homerton Fever Hospital and medical officer of health for Eastbourne. For a period of over 30 years he acted as medical officer of health for Paddington, for a large part of which time he was editor of *Public Health*, the official publication of the Society of Medical Officers of Health. Dr. Dudfield had a mathematical mind which turned naturally to the statistical solution of public health problems. He was a severe critic of slipshod method and regarded the lack of exact definition of puerperal fever as invalidating the mortality returns from this disease, while championing the right of the practitioner often to be in honest doubt in the diagnosis of exanthemata. He took an active part in the proceedings of the Royal Statistical Society, of which he was Guy Medallist and to which he held the position of honorary foreign secretary, while he was a titular member of the International Statistical Institute. His contributions to the *Journal of the Statistical Society* include such articles as On the Critical Examination of Methods of Recording and Publishing Statistical Data bearing on Public Health: Suggestions for the Improvements of Such Methods (1905); Some Unconsidered Factors Affecting the Birth-rate (1908); Still-births and Infantile Mortality (1912); Life Tables for Infants: Methods of Construction (1911). Dr. Dudfield was also at one time President of the Harveian Society and honorary secretary of the Epidemiological Section of the Royal Society of Medicine. Under the old Volunteer regulations he held the rank of surgeon-lieutenant to the 26th Middlesex Cyclists' Corps of the Rifle Volunteers, and during the war he was captain in the R.A.M.C. (T.), attached to the 1st City of London Sanitary Company. For his services in the field he was mentioned in despatches and received the Order of the British Empire. His death is a distinct loss to the public health service.

THE LEGAL RESPONSIBILITY OF THE SURGEON.

A MEETING of the Medico-Legal Society took place in the rooms of the Medical Society of London on April 21st, Lord Justice Atkin, the President, occupying the chair.

Lord Riddell read a paper introducing a discussion on the legal responsibility of the surgeon. He said he had no desire to lay down legal or medical opinions, but to ventilate the matter and ask for a reconsideration of problems which had arisen in these changed times of aspiration and needs, or imagined needs. The rules laid down in regard to criminal responsibility could be shortly epitomised; everyone, whether a licensed practitioner or not, was protected from criminal responsibility for performing, with reasonable care and skill, any lawful surgical operation on a person with his consent and for his benefit, providing he had regard to the patient's state at the time and all the circumstances of the case. Consent could be given by guardians or relatives. That consent, however, must not be exceeded. Neither lawyers nor doctors guaranteed cures; they only contracted to do their best, and this meant that a higher degree of skill was to be expected from the specialist than in the case of the ordinary practitioner. "Lawful" and "for his benefit" were subject to different interpretations. Ethical questions arose when considering the degree of danger for what would be otherwise a criminal offence. If the mortality from a certain operation was 97 per cent., was the surgeon justified in operating, after explaining the circumstances to the patient? Should it be done to please the patient? Lord Riddell did not think rules could be laid down in this respect.

Sterilisation.

His main purpose was to draw attention to the situation in regard to sterilisation which had arisen out of the modern teaching in eugenics and the recent discoveries in medical science. Under what circumstances was it justifiable to render men or women sterile? The practitioner had a duty to the State as well as to the patient, and this view had always been insisted on by the State, both in the matter of sterilisation and maiming. No surgeon was bound to perform an operation for sterilisation, but could he do it by agreement with the patient or her relatives? And, if so, under what circumstances? It was frequently thought that, apart from legal abortion, a surgeon and patient could agree to an operation, and if death resulted the surgeon was relieved of responsibility. That, however, was wrong. A man and a woman were not held to be masters of their own bodies, to dispose of as they wished, and the prohibition of self-maiming arose out of the same principle. Baron Bailey expressed the principle by saying that a prosecution in such cases was for the public benefit, and the willingness of the patient could not take away the offence against the public. In early days castration seemed to have been a common offence by injured husbands and angry women, but afterwards it was treated as a felony and was punished by death, the original object of the punishment being that the act took away the person's courage. The punishment had become modified, but it was still an offence; castration, except for pathological reasons, was illegal, and the surgeon was then guilty of unlawfully wounding, whether it was done with consent or not. Vasectomy for the purpose of preventing offspring came into the same category.

Sterilisation of women was a more frequent operation than castration, and the questions involved were of wide and growing importance. The law was not so clear on the sterilisation of women as it was in regard to castration in men. In women the removal, with or without the consent of the person, of uterus, ovaries, or Fallopian tubes was illegal, and was held to be against public policy. If pregnancies in a particular woman had been shown to be both difficult and dangerous, was the surgeon justified in sterilising her to save her life? And was one rule to be applied to married women and another to unmarried? If a woman had five children in five years and was much reduced in health in consequence, did that justify sterilisation? His view was that each case must be treated on its individual merits. The question was a very large one, especially in view of the fact that in this kingdom a child was being born every two minutes, and birth control had changed the habits of 350 million people in Europe and America, where, in a general way, the birth-rate was falling, and this quiet revolution might spread to the East. The matter should not be left entirely in the hands of the professors of gynæcology; the public were entitled to know what were the opinions held by the medical profession on the subject. If a wife gave consent for her sterilisation and the husband's consent had not been asked, he might have a cause of action for being deprived of the possibility of offspring, but he would have no cause for action if the operation were rendered necessary by a definite pathological condition. Mentally defective women were prolific in the matter of children; was sterilisation a legal procedure in such cases? He considered that it was not, unless the operation were for the medical welfare of the patient. It was illegal when performed solely to prevent her from having children.

In conclusion, Lord Riddell raised the question of cosmetic operations such as those associated with beauty parlours, the operations for the dispersal of the double chins of middle-aged women, and so forth. If sepsis and death ensued, did a charge of manslaughter lie against the practitioner?

Discussion.

Sir William Willcox said the medical man did not do an operation because the patient wanted it; if that course were pursued, it would be bad for both patient and the medical man. There must be some real medical benefit aimed at by the operation. He agreed that the operation of vasectomy in order to prevent the bringing of children into the world was illegal, and the use of X rays for such purposes came into the same category. He was strongly against the sterilisation of mental defectives, especially as it was often difficult to say who were mentally defective.

Sir Charters Symonds said the public had a right to express an opinion on the subject of the sterilisation of mentally defective persons. While such people were kept under supervision in institutions they were industrious and harmless, but if they improved and were allowed out, the girls became prostitutes and the men trended towards crime. His own view was that the time had come when these people should be sterilised.

Prof. Louise McIlroy quoted the case of a working woman with an ovarian tumour which caused her great pain, and her husband, in consequence of a quarrel they had had, would not consent to the removal of the tumour. In consequence she had to leave the hospital again unrelieved. That raised the question whether, the woman having consented, the operation should be done. She, the speaker, did not think that problem would ever be cleared up. In some cases, in which the doing of an operation was a danger to the patient's life, it was necessary to hedge somewhat on the legal aspect, and decide on the general circumstances of the case. The possible death of the patient should not affect the question of the operation itself. Now that the dosage of X rays was a matter of more exactitude, sterilisation could be produced for a year, and at the end of that time renewed if necessary. But in regard to many of these cases of difficult decision she could not avoid the feeling that she was walking on a volcano all the time. She did not know whether, in any action brought in respect of such cases, the surgeon would have the support of the legal profession, but the heads of the surgical profession would probably back up the procedure. She felt very strongly that surgeons had no right to sterilise mental defectives; she regarded that as an assault. These people were better in institutions; if allowed to go out, they interfered with the morals of the community. Sterilisation because of syphilis should never be done, and that was not so necessary now as the disease was much more curable.

Dr. Douglas Cowburn said the surgeon was actuated by the one single motive, the good of the patient. He was not liable for an error of judgment, even though such error might cause the death of the patient, unless it was so gross as to be inconsistent with reasonable skill, care, and diligence. He proceeded to discuss the relative responsibility of the surgeon and the anæsthetist.

"VOYAGE D'ETUDES MÉDICALES."—The nineteenth Voyage d'Etudes Médicales to the health resorts of France (organised solely for the medical profession) will take place during the first part of September under the scientific direction of Profs. Carnot and Rathery and will be devoted to the resorts of the north and east. The party will assemble at Berck-sur-Mer and will first visit Paris-Plage, Lille, and Saint-Amand, and thence proceed to Belgium in order to visit Brussels, Spa, Luxembourg, and Mondorf. Returning to France, via Niederbronn and Morsbronn, the nineteenth V.E.M. will visit Strasbourg, proceeding from there by motor-car to Schirmeck, le Hohwald, Sainte-Odile, Chatenois, and Ribeauvillé, then Colmar, Soulzmatt, Soulzbach, Munster, les Trois Epis, le Linge, le Col de la Schlucht, and Gerardmer. Crossing the Vosges again it will then follow the road of the Cretes and visit Bussang, Luxeuil, Plombières, Bains-les-Bains, Bourbonne, Martigny, Contrexéville, and Vittel. First-class accommodation is arranged throughout the journey and at the hotels. Further particulars may be obtained from Madame Juppé-Blaise, delegate of the French Spas, Office Français du Tourisme, 56, Haymarket, London, S.W. 1.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. to be Surg. Cmdrs.: F. C. Wright, H. E. Y. White, D. P. H. Pearson, I. S. Gabe, and A. J. Tozer.

Surg. Capt. E. T. Meagher is placed on the Retd. List with rank of Surg. Rear-Admiral.

ROYAL ARMY MEDICAL CORPS.

ARMY DENTAL CORPS.

Lt. T. D. Corke to be Capt.

TERRITORIAL ARMY.

Col. F. Kelly, having attained the age limit, is retired and retains his rank.

Lt.-Col. R. M. Vick resigns his commn. and retains his rank with permission to wear the prescribed uniform.

Majs. (Prov.) J. S. Hudson and A. C. Court are confirmed in their rank.

Capts. A. Morris and R. O. Ward to be Majs. (Prov.).

Lt. G. V. Davies to be Capt.

INDIA AND THE INDIAN MEDICAL SERVICE.

Maj. W. O. Walker, officiating civil surgeon, has been transferred from Jalpaiguri to Darjeeling, vice Lt.-Col. Proctor, transferred, or until further orders. Military Assist. Surg. S. J. V. Fox, civil surgeon, has been transferred from Jessore to Jalpaiguri, vice Maj. W. O. Walker, transferred, or until further orders. Military Assist. Surg. H. A. Young has been appointed to act as a civil surgeon and has been posted to Rajshahi, vice Maj. F. G. Gow, transferred, or until further orders. Lt.-Col. D. McCay, professor of clinical medicine, Medical College, Calcutta, and second physician to the College Hospitals, has been allowed leave for one year and seven months. Maj. J. D. Sandes, officiating civil surgeon, Hooghly, to act as professor of clinical medicine, Medical College, Calcutta, and second physician to the College Hospitals, vice Lt.-Col. D. McCay, granted leave, or until further orders. Maj. C. A. Godson, police surgeon, Calcutta, has been appointed to be civil surgeon, Hooghly, vice Maj. J. D. Sandes, transferred, or until further orders. The services of Capt. G. H. Fraser have been placed temporarily at the disposal of the Government of Bihar and Orissa for employment as officiating superintendent, European Mental Hospital, Ranchi. The services of Capt. N. Briggs have been placed temporarily at the disposal of the Government of the Punjab for employment in the Jail Department. Capt. A. C. Craighead has been appointed temporarily to the Medical Research Department, and posted as a supernumerary officer at the Central Research Institute, Kasauli, with effect from the date he takes over charge. The services of Lt.-Col. H. G. Stiles-Webb have been placed temporarily at the disposal of the Government of the Central Provinces. Col. J. A. Black, Inspector-General of Civil Hospitals, C.P., has been granted leave for a period of eight months. Col. F. Wall and Lt.-Col. H. Emslie-Smith have retired from the service. Capt. C. H. N. Baker has been appointed officer-in-charge, Medical Store Depôt, Rangoon, in addition to his other military duties.

DEATHS IN THE SERVICES.

Brigade Surg. Lt.-Col. William Edmondson Dudley, retd., who died at his residence in Bath at the age of 86 on April 13th, was born at Templemore, Tipperary, in 1838. He received his medical education at the Royal College of Surgeons in Ireland and qualified with the licentiateship of that body and with the L.A.H. Dub. in 1862. In the following year he obtained the L.R.C.P. Edin., and was appointed assistant surgeon to the 76th Regiment. From 1868 to 1871 he was on the Army Medical Staff and was afterwards attached to the Royal Artillery. Later he was attached to the 3rd Regiment (the Buffs) in the Zulu War of 1879 and was awarded the medal and clasp. In the Afghan War of 1880–81 he served with the 78th Highlanders. He retired in 1884 with the rank of hon. brigade surgeon.

The Minto Gold Medal for Research in Tropical Medicine for 1924 has been awarded to Maj. R. N. Chopra, I.M.S., of the School of Tropical Hygiene, Calcutta. This is the first time a member of the staff of the school has been the recipient of the award.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At the examination for the Diplomas in Public Health, Hygiene, and Tropical Medicine and Hygiene (New Regulations) the following candidates were successful:—

Part I.—Mohammed A. E. M. El Diwany, Andrew N. Fergus, Abdel R. Hassan, Mary K. Henegan, Charles F. Pedley, Colin H. H. Robertson, Lalib Shehata, Charles J. Stocker (distinguished), William J. Vickers, Alan D. Whitelaw, and Man K. Yue.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations held recently, of 125 candidates entered, the following 39 passed the Final Examinations:—

Henry Goldsmith, John A. Hyde, Lim K. Htoe, James Kirkness, Soo W. Tay, John Karkness, Fraser D. Muller, Harold B. Wainer, Robert T. Johnson, Winifred G. Price, Mohammed M. El-Makkawi, Alexander B. Jayasuriya, Appu H. T. de Silva, James L. Malone, Andrew Wilson, Myles E. T. Burke, Herbert A. Direkze, Sayed Ghaleb, Arumugam Chellappa, William A. Kemp, Sundaramier Ramakrishnan, Moses Kopelowitz, Arthur F. Senewiratne, Joseph F. Hedley, William J. Ledgerwood, Ronald H. Mackintosh, James Houston, Douglas B. Craig, Sing K. Sie, Matthew L. Hendrie, John M. Coutts, Isaac Joels, Hapuarachige D. J. Lazarus, Mordchei Gordon, Owen L. F. Senaratne, Peter King, William M. F. Ker, Mohammad J. Quaraishi, and Arthur A. F. Shepherd.

Medicine.—Constance C. Reid, Ella D. Messenger, John J. McKenna, Constance P. H. Hunter, Byerley C. F. Leembruggen, Palhalli R. S. Rao, Ee K. Lee, Parimal C. Sen, Thomas W. Chapman, John R. Hetherington, and Benjamin A. Meyer.

Surgery.—Irma E. L. Mackenzie, Constance C. Reid, Frederick Blacklee, Ella D. Messenger, Boo E. Khoo, William A. F. Hurst, Mela R. Soni, Alexander S. Ballantine, and William T. Baker.

Midwifery.—Bailey G. V. Dias, Lionel H. Wilson, Frederick Blacklee, Ella D. Messenger, George R. Mitchell, John J. McKenna, Constance P. H. Hunter, William A. N. Chanmugam, Byerley C. F. Leembruggen, Arumugam W. Rosiah, Ursula van Rooyen, Palhalli R. S. Rao, James C. Stenhouse, Mary A. McGill, Ee K. Lee, Parimal C. Sen, Thomas W. Chapman, John T. Fernandez, Benjamin A. Meyer, Max Camrass, Archie Franklin, and Alfred S. Hunt.

Medical Jurisprudence.—James Sharpe, Robert W. Schuch, James Cook, Lionel H. Wilson, Cyril A. Munro, Set C. Chee, Edwin H. Eastcott, John L. I. D'Silveira, Mikhail Youakim, Emile Fischbacher, Chin E. Toh, John D. Cooper, David D. Radford, Theodore Lipschitz, Mary D. Clark, John B. Panton, Nathanael J. Knoesen, and George R. Mitchell.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Beginning on Monday, May 11th, is a three weeks' course in Diseases of the Nose, Throat and Ear at the Central London Throat, Nose, and Ear Hospital, consisting of clinical demonstrations on out-patients and in the wards, lectures, &c., and an operative surgery class will also be available.—At the Maudsley Hospital a month's course in Psychological Medicine will be held from May 4th to 28th. The course will include lectures and demonstrations on the different aspects of mental disease. Various forms of clinical instruction will be open to those attending the course.—A two weeks' special course in Diseases of Infants will be given at the Infants Hospital from May 18th to 30th. The comprehensive syllabus covers clinical demonstrations, "round table" consultations, lectures, and four visits to centres away from the hospital.—An afternoon course in Dermatology will take place at the Hospital for Diseases of the Skin (Blackfriars) from May 18th to 30th. The work will embrace instruction in the out-patient department and the venereal clinics.—For those in general practice it is proposed to hold a two weeks' course at the London Temperance Hospital from May 18th to Friday, the 29th, Saturday excepted. The course will begin at 4.30 P.M., and will consist of a clinical demonstration (with cases) lasting for one hour, followed by a short lecture at 5.30 P.M. Programmes of the special courses for May can be obtained from the Secretary of the Fellowship at 1, Wimpole-street, London, W.

MAUDSLEY HOSPITAL.—A series of six clinical demonstrations of Types of Mental Disease will be given at the Maudsley Hospital, Denmark Hill, London, S.E., by Dr. Edward Mapother, medical superintendent, on successive Wednesdays, commencing May 6th, at 2.30 P.M. The series will be illustrated by numerous cases. Fee for the series 1 guinea.

NAVAL MEDICAL COMPASSIONATE FUND.—At the quarterly meeting of the directors of this Fund, held on April 17th at the Admiralty, London, S.W., Surgeon Vice-Admiral Joseph Chambers, C.B., C.M.G., Medical Director-General of the Navy, in the chair, the sum of £125 was distributed among the several applicants.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, April 27th.

ODONTOLOGY: at 8 P.M.
Clinical Evening:
Fellows and Members who are willing to show cases of interest are asked to communicate with the Hon. Secretary (Mr. Bayford Underwood, 26, Wimpole-street, W.) as soon as possible.

Tuesday, April 28th.

MEDICINE: at 5.30 P.M.
Papers:
Prof. Dr. E. Leschke (Berlin): Metabolism and the Sympathetic System.
Dr. O. Leyton: Hypoglycopyresis.

DISEASE IN CHILDREN
NEUROLOGY
THERAPEUTICS AND PHARMACOLOGY
} Members of these Sections are special invited to this meeting.

Friday, May 1st.

LARYNGOLOGY: at 5 P.M. (Cases at 4 P.M.)
Annual General Meeting:
Election of Officers and Council.
Cases and Specimens:
Shown by Mr. C. A. S. Ridout, Dr. Dan McKenzie, Sir James Dundas-Grant, Mr. G. W. Badgerow, Mr. H. A. Kisch, Mr. Walter G. Howarth, Mr. E. Musgrave Woodman, Dr. P. Watson-Williams, and others.
Dinner:
A combined dinner of the Sections of Laryngology and Otology will be held at the Langham Hotel on Friday, May 1st, at 7.30 for 8 P.M.

ANÆSTHETICS: at 8.30 P.M.
Annual General Meeting:
Election of Officers and Council.
Paper:
Dr. J. Blomfield: Accidental Damage during Anæsthesia.

Saturday, May 2nd.

OTOLOGY: at 10.30 A.M. (Cases at 9.45 A.M.)
Annual General Meeting:
Election of Officers and Council.
Paper:
Mr. Arthur Cheatle: The Mastoid Emissary Vein and its Surgical Importance (with specimens and lantern slides).
Specimens and Cases:
Shown by Mr. Arthur Cheatle, Mr. V. E. Negus, Dr. Dan McKenzie, Mr. Archer Ryland, and others.

ROYAL INSTITUTION, Albemarle-street, W.
TUESDAY, April 28th.—5.15 P.M., Prof. J. Barcroft: Effects of Climate on the Circulation (II.).
THURSDAY.—5.15 P.M., Mr. F. Kingdon Ward: Plant Hunting on the Roof of the World.
FRIDAY, May 1st.—5 P.M., Annual Meeting. 9 P.M., Prof. W. L. Bragg: Crystalline Structure of Inorganic Salts.
SATURDAY.—3 P.M., Mr. W. P. Pycraft: Use and Disuse Effect of Structure on Animals (II.).

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.
WEDNESDAY, April 29th.—8 P.M., Dr. Andrew Balfour: The Trend of Modern Hygiene.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, April 27th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
WEDNESDAY.—2 P.M., Dr. Burnford: Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Sir Henry Simson: Gynæcological Wards. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, April 27th, to SATURDAY, May 2nd.—HAMPSTEAD GENERAL HOSPITAL, Haverstock-hill, N.W. Special Post-Graduate Course in General Medicine and Surgery. Lectures and demonstrations daily (second week).—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E. Post-Graduate Course in Diseases of Children. Lectures and demonstrations morning and afternoon (second week).—ST. MARK'S HOSPITAL FOR DISEASES OF THE RECTUM, City-road, E.C. Post-Graduate Course in Proctology. Lectures, demonstrations, and operations every afternoon (second week).

UNIVERSITY COLLEGE HOSPITAL.

FRIDAY, May 1st.—11 A.M., Prof. A. V. Hill: The Physiology of Muscle and Nerve. (First of four public lectures.)

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)

TUESDAY, April 28th.—(At the Royal Southern Hospital.) Dr. F. H. Barendt: Common Skin Infections in Childhood.

WEDNESDAY.—(At the Northern Hospital.) Mr. T. P. McMurray: Arthrites of the Hip.

THURSDAY.—(At the Stanley Hospital.) Miss Nicholson: Ovarian Tumours.

FRIDAY, May 1st.—(At the Royal Infirmary.) Dr. Henry Cohen: Recent Therapeutic Advances.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, April 28th.—4.15 P.M., Mr. D. L. Sewell: Empyema of the Maxillary Antrum.

FRIDAY, May 1st.—4.15 P.M., Dr. F. Craven Moore and Mr. J. Morley: Demonstration of Cases.

MANCHESTER BABIES' HOSPITAL, Burnage-lane, Levershulme.

FRIDAY, May 1st.—8 P.M. (Post-Graduate Lecture), Mr. George Graham: The Use of Insulin for Young Children.

Appointments.

ASH, W. M., M.B., B.S. Lond., F.R.C.S. Edin., has been appointed Medical Officer of Health for Derbyshire.

BARR, W., M.B., Ch.B. Glasg., D.Sc. (P.H.), Medical Officer of Health for Rotherham.

BRUNTON, C. E., M.B., B.Ch. Dub., Research Pathologist to the Christie Hospital, Manchester.

DAVIES, G. I., L.R.C.P. Lond., M.R.C.S., Assistant Medical Officer, Lewisham Hospital.

HUGHES, E. R., L.R.C.P. Lond, M.R.C.S., Medical Officer and Public Vaccinator for the Holyhead District.

MCCULLAGH, W. McK., F.R.C.S. Eng., M.B., B.Ch. Belf., Assistant Surgeon to the Samaritan Free Hospital for Women, Marylebone-road.

RENNET, M. J., M.B., Ch.B. Aberd., Assistant Medical Officer of Health, Chester.

TAYLOR, J. S., M.B., Ch.B. Aberd., Senior Resident Medical Officer, Aberdeen City Fever Hospital, and Assistant Medical Officer of Health.

TIBBLES, SYDNEY, L.R.C.P. & S. Edin., Honorary Ophthalmic Surgeon to St. Pancras Dispensary.

Vacancies.

For further information refer to the advertisement columns.

Barnet, Wellhouse Hospital.—Res. M.O. £350.

Birmingham, Dudley-road Hospital.—Sen. Res. Surg. O. £700.

Birmingham and Midland Homœopathic Hospital and Dispensary.—Res. H.S. £175.

Bradford Royal Infirmary.—Two H.S.'s. Each £150.

Bristol, Royal Hospital for Sick Children and Women.—H.S. £125.

Cairo School of Medicine.—Asst. Prof. of Chemistry. L.E.720.

Cambridgeshire Tuberculosis Colony.—Asst. M.O. £300. Also H.P. at rate of £100.

Carmarthen, Joint Counties Mental Hospital.—Asst. M.O. at rate of £350.

City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. at rate of £100.

Dublin, Dept. of Local Government and Public Health.—Travelling Fellowships.

Durban Corporation, Natal.—Asst. M.O.H. at rate of £900.

Eastbourne, Princess Alice Hospital.—Res. H.S. at rate of £175.

East Ham County Borough.—Asst. M.O. £600.

Harefield, Middlesex, County Tuberculosis Sanatorium.—Third Asst. Res. M.O. £400.

Holland County Council, Lincolnshire.—Asst. County M.O. £600.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Asst. P.

King's College Hospital, Denmark Hill, S.E.—Hon. Psychotherapist.

Liverpool, New Psycho-Therapeutic Clinic.—Hon. Asst. P.

London County Council Mental Hospitals.—Eighth Asst. M.O. £440.

London Lock Hospital, 91, Dean-street, W.—Temp. Hon. S. to Out-patients.

Mexborough, Montagu Hospital.—Hon. Visiting and Consulting Surgeons.

Nottingham General Dispensary.—Res. Surg. £200.

Plymouth County Borough.—Asst. M.O.H. £750.

Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Asst. S.

Rochford Hospital.—Asst. Res. M.O. £125.

Royal Free Hospital, Gray's Inn-road, W.C.—Third H.S.

Royal Society of Medicine, 1, Wimpole-street, W.—Secretary. £800.

Ruthin Castle (Duff House), North Wales.—Jun. Res. P. £150.

St. Mary's Hospital for Women and Children, Plaistow, E.—Res. M.O. and Asst. Res. M.O. at rate of £175 and £130 respectively.

St. Pancras Hospital, Pancras-road, N.W.—Med. Supt, &c. £700.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Reg. at rate of £100.

Southampton, Free Eye Hospital.—H.S. £150.

Stoke-on-Trent County Borough.—Asst. M.O. £500.

Westmorland Sanatorium, Meathop, Grange-over-Sands.—Res. Asst. M.O. £350.

Whittingham County Mental Hospital, Preston, Lancs.—Two Temp. M.O.'s. Each £7 7s. weekly.

Winsley Sanatorium, near Bath.—Asst. Res. M.O. £250.

Wolverhampton and Staffordshire Hospital.—H.S. at rate of £150.

THE Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments:—Lyndhurst, Hants; and Calvert, Bucks.

Births, Marriages, and Deaths.

BIRTHS.

BROUGHTON-ALCOCK.—On April 12th, at Grosvenor-street, W., the wife of Dr. W. Broughton-Alcock, of a daughter.

CLEMENTS.—On April 9th, the wife of Dr. W. A. Clements, of Daventry, Northants, of a daughter.

EVANS.—On March 26th, at Aden, Arabia, to Marjorie, the wife of Captain R. R. Evans, R.A.M.C.—a daughter.

GOODWIN.—On April 14th, at Acacia-road, St. John's Wood, N.W., the wife of Aubrey Goodwin, F.R.C.S., of a daughter.

HIGSON.—On April 12th, at a London nursing home, the wife of Dr. W. Davies Higson, "Eversley," Boxley-road, Maidstone, of a daughter.

MCCORMICK.—On April 14th, at St. John's Wood-court, N.W., the wife of Dr. J. E. McCormick, of a daughter.

MARRIAGES.

OLIVER—BARRITT.—On April 16th, at Albert-road Wesleyan Church, Colne, Thomas Herbert Oliver, M.D., to Martha Florence Barritt, M.B., Ch.B., younger daughter of Mr. and Mrs. D. H. Barritt, of "Brantwood," Colne.

SYMONS—DE WILDE.—On April 18th, at the Church of St. Martin-in-the-Fields, London, Hubert Wallace Symons, M.B., F.R.C.S., Major, R.A.M.C. (T.A.), to Charlotta Dolores Naomi de Wilde, M.R.C.S., L.R.C.P., younger daughter of the late Mr. and Mrs. Henri de Wilde, of Utrecht and London.

DEATHS.

DUDFIELD.—On April 19th, from appendicitis, in London, Samuel Reginald Orme Dudfield, O.B.E. (Mil.), late Captain R.A.M.C., M.A., M.B., D.P.H., F.S.S., M.O.H. for Paddington for 30 years, aged 64.

DUDLEY.—On April 13th, at Portland-place, Bath, Brigade Surgeon Lieut.-Colonel William Edmondson Dudley, aged 86.

ELLIOTT.—On April 18th, after a short illness, Thomas Elliott, M.D., of Church-road, Tunbridge Wells, aged 75.

GODLEE.—On April 20th, at Coombe End, Whitchurch, Oxon, after a few hours' illness, Sir Rickman John Godlee, Bt., K.C.V.O., F.R.C.S., aged 76.

LIBBY.—On April 18th, at Rudyard, Staffordshire, Harold Samuel Libby, L.R.C.P., M.R.C.S.

RAYNE.—On April 17th, at St. Mary's Gate, Lancaster, Charles Alfred Rayne, M.D., aged 79.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

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REMOVAL OF BETHLEM HOSPITAL. — Formal notification is made of the intention of the City corporation and the governor of Bethlem Hospital to apply to Parliament in the present session for an Act to empower the transfer and purchase of property necessary for the removal of the institution to Monks Orchard Estate at Beckenham and West Wickham, in Kent.

Notes, Comments, and Abstracts.

HEALTH CONDITIONS IN THE FEDERATED MALAY STATES.

Mr. William George Maxwell, C.M.G., Chief Secretary to Government, is responsible for the annual report, on which the following summary is based. The Federation comprises four States: Perak, Selangor, Negri Sembilan, and Pahang. A census taken in April, 1921, showed that the population was then 1,324,890, having increased since 1911 by 27·7 per cent. Of this population 853,528 were males and 471,362 females. The Malay population was 510,821, and the Chinese population 494,548, whilst 305,219 persons of Indian nationality were enumerated, more than four-fifths of these being Tamils. The European population rose from 3284 in 1911 to 5686 in 1921, of whom 92·3 per cent. are of British origin. The most satisfactory feature of the census is that all the statistics, of sex, of marriage, of age, and of birthplace, show that the immigrant races, who have done so much to develop the resources of the Federated States, are ceasing to look upon these States as a place of temporary sojourn, and are tending more and more to make their permanent home here. The birth-rate in 1923 was 25·66 and the death-rate 24·40 per mille. There were 6420 deaths of children under 1 year of age, being an infantile mortality of 180·07 per mille.

Causes of Sickness and Death.

As usual, malaria heads the list as the most important cause of sickness and deaths. The number of deaths recorded was 15,516 (11·17 per mille). Considerable attention is being focused on the educational side of the malaria problem and the arousing of public interest therein. Malaria is a notifiable disease in many sanitary board areas. Difficulty continues to be experienced in inducing the public to avail itself of the facility for hospital treatment of venereal diseases in the early stages. Public education regarding these diseases is, however, being actively promoted. Venereal disease clinics, centres, and propaganda are in process of organisation. Injections of novarsenobenzol were given in 29,675 cases. The campaign against yaws was continued throughout the year with gratifying results. Injections of novarsenobenzol were given to 31,135 persons, as against 22,972 in 1922. Little trouble is found in persuading people to undergo treatment, and considerable progress has been made in the eradication of this disease. Sixteen cases of plague, 12 of cerebro-spinal meningitis, 32 of small-pox, and 17 of diphtheria occurred. There was no case of cholera.

Infant Welfare.

The infant welfare centre in Kuala Lumpur has made extraordinary progress. The centre is primarily an educational institution, which provides for young mothers of all nationalities advice and teaching in the care and management of their infants. The work of the centre is directed rather to the supervision of the health of the infant and the education of the mother than to the treatment of the sick, but the incidental treatment of simple ailments is nevertheless included within its scope. The staff consists of a lady medical officer, a European nursing sister, and six health visitors. "Health visiting" is an essential factor in the programme of the infant welfare, and it is satisfactory to record that the prejudice against the invasion of the home by strangers, which is even more marked in the East than in the West, is gradually disappearing as the mothers are understanding that the object of the visit is to help and not to harass. Particular attention is given to antenatal work, and to education and propaganda. The Kuala Lumpur centre has been so successful that arrangements are being made to extend this form of activity to other places.

Hospitals and Dispensaries.

There are in the Federated States 4 European hospitals, 40 district hospitals, 3 women's hospitals, 3 leper asylums, 7 gaol hospitals, 1 quarantine camp (for immigrants), 4 vagrant or decrepit wards, 1 mental hospital, 14 outdoor dispensaries, and 10 town dispensaries. During the year there were 87,310 indoor patients. Outdoor patients numbered 527,414, as compared with 433,111 in 1922 and 329,310 in 1921; the increase is due in a great measure to the travelling dispensaries which were started towards the end of 1922. These bring medical requirements to sufferers living in distant places removed from ordinary medical facilities. On Dec. 31st the patients at the only institution for mental disorders—the Central Mental Hospital, Tanjong Rambutan—numbered 900 males and 254 females. During the year 358 men and 111 women were admitted. The increase in the number of female admissions is noteworthy; alcohol accounted for 42, and syphilis for 25 admissions. The commonest form of mental disease on admission was recent melancholia, with 115 victims.

In the department of research the investigation into the disease meliodosis was continued throughout the year, and additional evidence obtained in demonstration of its specific character. The first recorded case of the disease in a European came under observation. A rare case of typhoid septicæmia was discovered and examined. The Far Eastern Association of Tropical Medicine at the Fifth Congress held in Singapore in September discussed at length the subject of beri-beri, and finally adopted a number of resolutions, including a recommendation that each of the Governments interested and the International Health Board of the Rockefeller Foundation be invited to nominate a representative on a beri-beri committee which shall report at the next Congress. Investigations were conducted in connexion with cases of plague which occurred in Kuala Lumpur during the months of April and May. Live rats examined showed a flea index of 3·0, and all fleas were of the species *Xenopsylla cheopis*. These results dispose of the surmise that freedom from serious outbreaks of plague in this country might be due to the absence of an efficient transmitting agent. Further valuable research into the treatment of malaria by quinine and other alkaloids of cinchona has been conducted.

Research into the subject of the seasonal prevalence of species of anopheline mosquitoes was continued. As a result of investigation covering a period of three years, the definite conclusion appears to emerge that these mosquitoes occurring in this country have no definite breeding season, but breed throughout the year, and increase in frequency when conditions become suitable. Investigation work was undertaken on estates in Johore and at Sabak Bernam. At the latter place five specimens of *A. barbirostris*, a species hitherto considered to be innocuous, were found to be infected, and there appears little doubt that the species is an important factor in the outbreak of malaria there.

Temperature and Rainfall.

The temperature of the west coast of the Malay Peninsula has but a small daily range and little appreciable variation. On the east coast, however, the north-east monsoon, lasting from November to March, causes a distinct meteorological contrast with the rest of the year as regards wind and rainfall. Records from typical stations on the west of the peninsula, where the south-west monsoon is broken by Sumatra, show a decrease of rainfall from May to August. At Kuala Lipis, on the east of the main range, there is a general rise in rainfall from February until May, succeeded in some years by a distinct drop in July and August; there is a further rise culminating in October and November, followed by a fall to moderate rainfall in December and January. Charts, however, cannot bring out two points: the brilliant sunshine, which is the rule during the morning, and the dry spells of a fortnight or more when the grass becomes parched. In the mountains the rainfall is very high, the yearly average at Maxwell's Hill above Taiping from 1912–19 being 258 inches. At Telebu in Negri Sembilan, the driest station where records were kept, the average for 1905–19 was 60 inches. The heat, owing to the moisture of the atmosphere, is at times oppressive, although 100° F. has never been recorded in the shade.

DETERMINATION OF THE TOTAL MASS OF THE BLOOD.

IN a recent issue of the *Archives de Cardiologia y Hematologia* (vol. iii., March, 1924), of which we have received a reprint, Drs. F. Sanchis Perpina and R. Diaz Sarasola describe a method of determining the total mass of the blood, which is a modification of that employed originally by Harris and Loewy in America as follows: (1) They first determine the relative amounts of serum and blood corpuscles by centrifugalising in a graduated tube 10 c.cm. of the blood; (2) they inject intravenously 1 c.cm. of a watery solution of Congo-red which has been determined colorimetrically; (3) after five minutes another 10 c.cm. of the blood is taken and centrifuged, and the serum is then compared in Hellige's colorimeter with a 1 per cent. solution of Congo-red in serum. They give a table of equivalents between the colorimeter scale and the total quantity of serum, which presumably has been arrived at by adding a 1 per cent. solution of Congo-red to a known quantity of serum and from this they calculate the amount of serum adding in the corpuscles. The table gives up to 600 c.cm., which has been sufficient for their experiments on the dog. The authors admit that the method is not very exact, putting the limit of possible error at 6 per cent., as verified by animal experiment so far as possible. If the scale is prepared as suggested, the question may be asked: Is the Congo-red solution taken up by blood in vitro in the same proportion as when it is circulating in the tissues?

"GERM DISSEMINATION."

A MEDICAL man writes to us, under this title, drawing attention to the complete recklessness not only of the public but of individuals who from their position should know better, as to the possible spread of infections from the coughing, sneezing, and nose-blowing performances of the victims of catarrh. Our correspondent is himself a pulmonary subject who, as he says, "personally coughed and sneezed my way through life," and he has found it practicable through the use of relays of paper handkerchiefs and an invariable watchfulness to secure the public as well as the members of his family from the chances of infection due to carelessness. As an example of such carelessness he says: "Behold no less a personage than the M.O.H. of my borough, who at great length and with great particularity erroneously diagnoses his complaint as recurrent disease of the antrum, coughing and sneezing to the peril of anyone within the range of ten yards, and emphasising his sufferings and rounding his periods with an oratorical flourish of the handkerchief." His visit was followed by an outbreak of influenzal colds.

By a coincidence the situation is the subject of the illustration which follows, reproduced from the April *Bulletin of the City of Chicago Municipal Tuberculosis Sanitarium*.

The legend beneath is:—

"This is the man with the cold,
He shares his germs with neighbours and friends,
And keeps the children from growing old."

The picture is one that we have all seen in our own trains, as well as in buses and theatres, well-educated citizens appearing to believe that if they conform to the printed regulation against spitting—and save in the lowest classes the habit has largely disappeared as an ordinary conformity to manners—they have taken all the precautions required of them against the spread of infection.

"NURSING DON'TS."

AT the fifteenth annual Hospital, Nursing, and Midwifery Exhibition and Conference, which is being held this week at the Central Hall, Westminster, Dr. George Steele-Perkins delivered on Monday, April 20th, an address to nurses, in which he gave his hearers the crystallised fruits of much practical experience in the little details that make for the comfort of the sick. The lecture was entitled "Nursing Don'ts," and the speaker hoped that by setting red lights at the pitfalls of nursing, the right road might more easily be followed. Out of the wide range of subjects covered, we might with profit reproduce a few of Dr. Steele-Perkins's wise utterances, chosen at random. He says to nurses:—

Don't knock against a bed—to do so is very painful to gouty and rheumatic patients, and to patients in pain—it is very unpleasant to *all* patients and shows you are careless, and hence a patient may lose confidence in you.

Don't be high and mighty—study the convenience of the people with whom you are, while also maintaining your professional dignity.

Don't tell stories to endeavour to show the skill of your pet doctor.

Don't stay in the sick room *all* the time of the doctor's visit. It is tactful and thoughtful to retire, so that a patient can have the opportunity of making any complaint should he wish to do so, and which he might not care to make before the nurse.

Don't say "Dear" to any female patients over 18—they do not like it.

Don't neglect to cleanse your thermometer in the presence of your patient—patients can't help the thought "into whose mouth did that thermometer go last, and I wonder if it has been cleaned since?"

Don't be harsh on a patient's relatives. They may have no medical knowledge, but they are naturally anxious and worried. They mean well, even if they are sometimes fussy.

Don't expect the relatives in a private house to be invisible, as in hospital, only existing, as it were, between three and four on visiting days.

Mutatis mutandis, others besides nurses might do well to remember a few of these points.

THE CURE OF PRESENT DISCONTENTS.

AN anonymous writer in the *Bath Herald*, stimulated by the Prime Minister's recent plea for a spirit of goodwill and coöperation among all parties, pointed out recently that one relief for our present disabilities would be for each one to disallow in himself or herself the desire for more money to expend on objects wrong in themselves or in excess. This is topical counsel for the season we have just passed, and sound advice at all times. The writer enters a plea for economy and the banishment of luxury, two things which must escape exact definition, as both are conditioned by circumstances. Rightly interpreted, however, and exercised, these virtues would promote the health and well-being of the community to an amazing extent. Some of the illustrations which the writer gives in proof of the lack of these virtues among the community are very familiar but none the less forcible. Obvious waste of food is a social crime, but money spent reasonably on entertainment improves the work done; such expenditure becomes unreasonable only when the output or standard of work suffers through excess of amusement. Betting by introducing an element of complete chance into domestic budgets must always be uneconomical, while the writer would find large endorsement to-day of his view that wines and spirits should be used as medicines rather than daily beverages.

WIRELESS IN HOSPITALS.

THE use of broadcast receivers in hospitals and kindred institutions has stimulated Messrs. A. J. Stevens and Co., Ltd., of Walsall-street, Wolverhampton, to construct a radio-receiving set particularly adapted for institutional use. As shown by the illustration, it consists of a specially

designed cabinet containing a new model four-valve set which can be used on a frame or indoor aerial, and with plug-in coils is capable of responding to all wave-lengths from 150 to 20,000 metres. With a good aerial and earth equipment it is claimed that several loud speakers can be worked from the one instrument. It is pointed out that the special method of low-frequency intervalve coupling employed almost completely eliminates undesirable outside interference, thus enhancing the quality of music and speech received. The containing cabinet is fitted with rubber casters to ensure silence in moving the set, and receptacles are provided to contain spare head-phones, the cupboards for the batteries being fitted with lock and key. The price of this hospital set is £47 plus the Marconi royalty of £2 10s.